

A PROPOSAL FOR DESIGN GUIDELINES FOR DEMENTIA CARE FACILITIES
IN HAWAI'I

A DARCH PROJECT SUBMITTED TO THE GRADUATE DIVISION OF THE
UNIVERSITY OF HAWAI'I AT MĀNOA IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

DOCTOR OF ARCHITECTURE

MAY 2016

By

Landon Hamada

DArch Committee:

Joyce M. Noe, Chairperson

Dwight Mitsunaga

Dr. Christy Nishita

Keywords: Design Guidelines, Dementia Care Facilities, Alzheimer's disease,
Homelike Integration

Acknowledgements

This dissertation is dedicated to my late grandpa. Many times, over our years together, he told me *ganbatte*, which in Japanese means, “Do your best” or “good luck”. After his passing, my memory of these exchanges and many more gave me the continued motivation I needed to complete this dissertation.

I would never have been able to achieve this without the support of my family. Thank you, from the bottom of my heart, for your continuous love and support.

I would like to express my deepest appreciation and gratitude to my advisor, Joyce Noe, for her caring and patience, and for providing me with the confidence I needed to complete this project. I would like to thank my other committee members, Dr. Christy Nishita and Dwight Mitsunaga, for their expertise and for taking time out of their busy schedules to help me compile my research.

I would like to express my deepest gratitude to each person in the architectural field who helped me with the numerous questions I have had. I would also like to thank each person who is affiliated with Alzheimer’s and dementia that provided me with information and guidance. Your knowledge, patience, and care are truly unbelievable, and I would not have been able to complete this dissertation without you.

I would like to thank Reece Bonilla and Mark Tabucbuc for always being willing to help me out and offer suggestions. Graduate school would have been difficult without you two. I would also like to thank Steven Hill for being a great boss and giving great suggestions. I would also like to thank Anna Dondur for helping me with the editing of the manuscript.

Finally, I would like to thank Liza Matsumoto for being very understanding with me over the past five years. Your love and passion for nursing and your love for me has helped me tremendously.

Abstract

In Hawai'i, there is a significant population of older adults who suffer with some form of dementia, and the numbers are predicted to increase more rapidly over the next decade as the baby boom generation reaches retirement age. At the same time, many care facilities profess to offer various special dementia or memory care programs. But what exactly does this mean? What are the standards these facilities use to ensure proper care of those with dementia?

Hawai'i often trails behind current trends, technologies, and designs, moving laggardly toward necessary change. The field of dementia care in Hawai'i is no different. There exist no set guidelines or standards by which a care facility must abide in order to offer specialized care. This dissertation addresses this lack.

The first part of this project presents the research, which discusses the specifics of Alzheimer's disease and dementia and examines existing design considerations and guidelines, different types of care facilities, and existing dementia care therapies. Case studies take a closer look at four local care facilities that offer dementia or memory care to see how they stand up to the existing body of knowledge and compare to each other. They offer a glimpse into current dementia care in Hawai'i.

The second part of this project presents a set of guidelines for building Dementia Care Facilities in Hawai'i. This portion is arranged in a format that is accessible to architects and designers.

Table of Contents

Acknowledgements	2
Abstract	3
Preface	18
Table of Contents	4
Part 1: Research.....	11
Chapter 1: Introduction	21
Organization.....	22
Hawai'i State Population Figures	24
Chapter 2: Alzheimer's Disease and Dementia	27
Alzheimer's Disease.....	27
Stages of Alzheimer's Disease	32
Predicting Factors	37
Behavioral Issues	38
Dementia	43
Types of Dementia	44
Chapter 3: Existing Therapies	46
Music and Art Therapy	46
Namaste Care.....	49
Planning	49
Space	49
Staffing	50
Communication	50
Aromatherapy	50
Bright Light Therapy.....	50
Simulated Presence Therapy.....	51
Chapter 4: Dementia Care Facility Types	52
What is a Dementia Special Care Unit?	52
Other Types of Nursing Facilities	53

Adult Day Care (ADC)	53
Assisted Living Facility (ALF)	53
Adult Residential Care Home (ARCH).....	54
Continuing Care Retirement Community (CCRC)	54
Community Care Foster Family Home (CCFFH).....	54
Intermediate Care Facility (ICF)	54
Skilled Nursing Facility (SNF).....	55
Respite Care (RC).....	55
Comparison of the Dementia Care Facilities in Hawai'i	55
Chapter 5: Existing Guidelines	60
Universal Design	60
Assisted Living Guidelines	62
Critical Design Considerations	62
Summary of Regnier's Design Considerations	70
Visitability	71
California's RCFE (Residential Care Facilities for the Elderly).....	72
Chapter 6: Case Studies	74
Objective	74
Case Study 1: Manoa Cottage in Kaimuki (SNF)	75
Project History	76
Demographics of the Surrounding Area	80
Environmental Information.....	81
Architectural Drawings Architectural Drawings.....	82
Cost and Activities Information	85
Case Study 2: The Plaza at Moanalua (ALF, Memory Care)	88
Project History	89
Demographics of the Surrounding Area	93
Environmental Information.....	94
Architectural Drawings.....	95
Cost and Activities Information	99
Case Study 3: The Plaza at Mililani (ALF, Memory Care)	103
Project History	104

Demographics of the Surrounding Area	108
Environmental Information.....	109
Architectural Drawings.....	110
Cost and Activities Information	113
Typical Day in the Life of a Resident at The Plaza at Mililani	116
Case Study 4: Kahala Nui – Hi’olani Care Center (CCRC)	117
Project History	118
Demographics of the Surrounding Area	123
Architectural Drawings.....	125
Cost and Activities Information	132
<i>Typical Day in the Life of a Resident at Kahala Nui Hi’olani Care</i>	136
Comparison.....	137
Summary of Part 1.....	143
Part 2: Design Consideration.....	146
Introduction to Part 2	147
Homelike Integration.....	149
Introduction	149
Philosophy of Care.....	150
Introduction.....	150
Entry	152
Introduction.....	152
Living Room	155
Introduction.....	155
Dining Room	157
Introduction.....	157
Kitchen.....	159
Introduction.....	159
Bedroom	162
Introduction.....	162
Restroom	165
Introduction.....	165
Shower room.....	169

Introduction.....	169
Therapeutic Room	173
Introduction.....	173
Integration with Other Amenities	175
Introduction.....	175
Activity Room	177
Introduction.....	177
Back of House (BOH)	178
Introduction.....	178
Exterior Guidelines	180
Introduction	180
Neighborhood Approach	181
Introduction.....	181
Site Orientation	183
Introduction.....	183
Building Appearance.....	185
Introduction.....	185
Outdoor Acoustics.....	187
Introduction.....	187
Wandering Gardens or Therapeutic Gardens	189
Introduction.....	189
Rooftop Green Roof	190
Ground Preparation	195
Introduction.....	195
Outdoor Furniture.....	198
Introduction.....	198
Outdoor Security and Safety	200
Introduction.....	200
Sensory Environment	203
Introduction	203
Interior Acoustics	204
Introduction.....	204

Floor	205
Walls.....	205
Ceilings.....	205
Lighting	210
Introduction.....	210
Smells or Odors	213
Introduction.....	213
Reducing Glare	214
Introduction.....	214
Color	217
Introduction.....	217
Patterns.....	220
Introduction.....	220
Thermal Comfort	223
Introduction.....	223
Linking the Interior Space with the Exterior Space.....	225
Introduction.....	225
Interior Guidelines	227
Introduction	227
Wayfinding	228
Introduction.....	228
Visual Cues.....	231
Introduction.....	231
Signage.....	235
Introduction.....	235
Spatial Layout	237
Introduction.....	237
Interior Furniture	240
Introduction.....	240
Indoor Safety and Security.....	244
Introduction.....	244
Elopement.....	246

Introduction.....	246
Windows	248
Introduction.....	248
Daylighting	249
Introduction.....	249
Interior Doors	252
Introduction.....	252
Summary	256
Checklist of Guidelines	261
Homelike Integration	261
Entry	261
Living Room	261
Dining Room.....	262
Kitchen	262
Bedroom.....	263
Restroom.....	263
Shower Room.....	264
Therapeutic Room.....	265
Integration with Other Amenities	266
Activity Room	266
Back of House (BOH)	267
Exterior Guidelines.....	268
Sensory Environment.....	273
Interior Guidelines.....	278
Figures	11
Tables.....	11
Vocabulary.....	283
Types of Facilities	283
Types of Insurance	285
General Vocabulary	286
Appendix A	290
Additional Resources	290

Chapter 1.....	290
Chapter 3.....	290
Chapter 6.....	291
Appendix B	292
Certified Aging-In-Place Specialist.....	292
Objective	292
Information Regarding CAPS	292
Personal Experiences	294
Lessons Learned.....	296
Appendix C	298
State Regulations for Dementia Care	298
Objective	298
Bibliography.....	330

Tables

Table 1: Hawai'i residential population by county from 1980 to 2040.	25
Table 2: Hawai'i's population of adults 60 years and older and 85 and years and older. Forecasts are based on the Hawai'i DBEDPT projected 2035 population for Hawai'i of 1,598,700.	26
Table 3: Skilled Nursing and Intermediate Care Facilities in Hawai'i.	56
Table 4: Building and Resident Information for Manoa Cottage in Kaimuki.	76
Table 5: Air Quality in Kapahulu. Area Data of air quality in the Kapahulu area.	81
Table 6: Cost of Rooms and Additional Costs of Manoa Cottage in Kaimuki.	85
Table 7: Building and Resident Information for the Plaza at Moanalua.	89
Table 8: Air Quality in Moanalua.	94
Table 9: Cost of Rooms at the Plaza at Moanalua Information provided by Administrator Shannon Miyazaki.	99
Table 10: Typical Daily Schedule.	102
Table 11: Building and Resident Information for the Plaza at Mililani.	104
Table 12: Air Quality in Mililani Mauka Area.	109
Table 13: Cost of Rooms at the Plaza at Mililani. Information provided by Residence Relations Manager Jarrett Chun.	113
Table 14: Typical Daily Schedule at The Plaza at Mililani.	116
Table 15: Building and Resident Information for the Kahala Nui – Hi'olani Care Center.	118
Table 16: Air Quality in Kahala Area.	124
Table 17: Cost of Rooms at the Kahala Nui – Hi'olani Care Center.	132
Table 18: Typical Daily Schedule.	136
Table 19: Comparison of Variables between Case Studies.	137
Table 20: Decibel Chart.	188
Table 21: STC Chart describing the different materials and their STC absorption rate.	208
Table 22: Minimum illumination levels recommended for a Dementia Care Facility using daylight or electrical lamps with a CRI value of 80 or more as specified by the Illumination Engineering Society of North America.	211
Table 23: Examples of good and poor contrasting color by Elizabeth Brawley in "Designing for Alzheimer's Disease."	218
Table 24: Specifications for building for dementia care by state according to the AHCA/NCAL Assisted Living State Regulatory Review 2013 where: 1) Physical Plant Requirements, 2) Residents Allowed per Room, 3) Bathroom Requirements, 4) Life Safety, 5) Alzheimer'	300

Figures

Figure 1: Image of a nerve cells being infected by beta-amyloid plaque.	28
Figure 2: Cross sections of the brain comparing a normal brain to one of an Alzheimer's patient with locations of different functions labeled. Source: Scott, Pamela. "Behavioral." Lecture, Alzheimer's Association Hawai'i Chapter, Honolulu, HI, March 26, 2015.	30
Figure 3: Cross sections between a healthy brain versus a brain with severe Alzheimer's Disease.	31
Figure 4: Percentages gathered from the video, "Mild Cognitive Impairment Research," on the Alzheimer's Association website.	33
Figure 5: Chart showing 2011 numbers of injuries by career industry. Data from the Bureau of Labor compiled in 2011 from 58,860 work related incidents.	67
Figure 6: Exterior view of Manoa Cottage in Kaimuki	75
Figure 7: Manoa Cottage in Kaimuki is located on Oahu.....	77
Figure 8: Manoa Cottage in Kaimuki is located on Oahu.....	78
Figure 9: Manoa Cottage in Kaimuki is located on Oahu.....	79
Figure 10: Graph of the temperature in the Kapahulu area.	81
Figure 11: Manoa Cottage in Kaimuki Site Plan. Drawing edited by author.	82
Figure 12: Manoa Cottage in Kaimuki First Floor Plan. Drawing edited by author.	83
Figure 13: Manoa Cottage in Kaimuki Second Floor Plan. Drawing edited by author.	84
Figure 14: Activities calendar example provided by Administrator Calvin Hara.	87
Figure 15: Exterior view of The Plaza at Moanalua	88
Figure 16: The Plaza at Moanalua is located on Oahu.....	90
Figure 17: The Plaza at Moanalua is located on Oahu.....	91
Figure 18: The Plaza at Moanalua is located on Oahu.....	92
Figure 19: Graph of the temperature in the Moanalua area.....	94
Figure 20: The Plaza at Moanalua Memory Care Floor Plan. Courtesy of Wattenburger Architects.	95
Figure 21: The Plaza at Moanalua Memory Care Studio Sample Floor Plan.	96
Figure 22: The Plaza at Moanalua Memory Care Semi-Private Sample Floor Plan.	97
Figure 23: The Plaza at Moanalua Memory Care One Bedroom Sample Floor Plan.	98
Figure 24: Activities provided by Administrator Shannon Miyazaki.....	101
Figure 25: Exterior view of The Plaza at Mililani.	103
Figure 26: The Plaza at Mililani is located on Oahu.....	106
Figure 27: The Plaza at Mililani is located on Oahu.....	107
Figure 28: The Plaza at Mililani is located on Oahu.....	107

Figure 29: Graph of the temperature in the Mililani Mauka area.....	109
Figure 30: The Plaza at Mililani Memory Care Floor Plan	110
Figure 31: The Plaza at Mililani Memory Care Studio Sample Floor Plan.	111
Figure 32: The Plaza at Mililani Memory Care Semi-Private Sample Floor Plan.	112
Figure 33: Activities provided by Administrator Dawn Meaney.	115
Figure 34: Exterior view of Kahala Nui.	117
Figure 35: Hi'olani Care Center at Kahala Nui is located on Oahu.	120
Figure 36: Hi'olani Care Center at Kahala Nui is located on Oahu.	121
Figure 37: Hi'olani Care Center at Kahala Nui is located on Oahu.	122
Figure 38: Graph of the temperature in the Kahala area.	124
Figure 39: Kahala Nui Site Plan. Courtesy of Mariel Moriwake from Architects Hawai'i Ltd.	125
Figure 40: Kahala Nui Hi'olani Care Center Floor Plan. Source: Mariel Moriwake of Architects Hawai'i Ltd. Floor Plan edited by author.	126
Figure 41: Kahala Nui – Hi'olani Care Center Assisted Living One Bedroom Floor Plan.	127
Figure 42: Kahala Nui – Hi'olani Care Center Assisted Living Alcove Bedroom.	128
Figure 43: Kahala Nui – Hi'olani Care Center Assisted Living Alcove Bedroom.	129
Figure 44: Kahala Nui – Hi'olani Care Center Comprehensive Nursing Private Bedroom.....	130
Figure 45: Kahala Nui – Hi'olani Care Center Comprehensive Nursing Semi- Private Bedroom Floor Plan.	131
Figure 46: Activities Calendar example provided by Director of Marketing and Community Outreach.	135
Figure 47: Kahala Nui's lobby offers a good sense of the Aloha Spirit that many local residents recognize.	153
Figure 48: At the end of the entry, there is an outdoor seating area that connects the exterior with the interior. The lobby at Kahala Nui also is naturally ventilated, another aspect of life with which many residents in Hawai'i are accustomed.	154
Figure 49: Furniture can help create smaller zones within a larger zone.....	156
Figure 50: Examples of good and poor color choices for the dining room. Blue and green are not recommended in the dining room because they may discourage eating.	158
Figure 51: A typical kitchen layout that offers a homelike feeling yet still functions as a full kitchen for staff members.....	161
Figure 52: A typical layout for a semi-private bedroom (left) and a private bedroom (right). The bedroom should resemble the resident's own bedroom.	

For semi-private bedrooms, strategically placing cabinets and dressers can help divide the space and create a greater sense of privacy.....	163
Figure 53: Examples of different colors and textures for the bedroom. The color palette above shows typical colors of bedroom walls from case study site visits.	164
Figure 54: Faucets 1, 2, and 3 are appropriate for a Dementia Care Facility because the handles are arthritis-friendly; faucets 4, 5, and 6 are not. Faucets should not have chrome finish as it may create glare.....	166
Figure 55: Location of the grab bars in a restroom.	168
Figure 56: The first shower room option is the shower pan option where the entire room is a shower. The floors are finished with a material that is slip resistant and contrasts with the wall colors and textures. Also, the shower includes a collapsible bench for residents to use while showering.	171
Figure 57: The second shower room option is the walk-in tub option. Walk-in tubs can provide extra comfort and security for residents suffering from Alzheimer's disease.	172
Figure 58: Color palette for the therapeutic room. This color palette is similar to that found in the Namaste Care room at Manoa Cottages in Kaimuki.	174
Figure 59: Three examples— 1, 2, and 3—of simple ways to incorporate amenities such as a newspaper rack or magazine stand, which can offer mental stimulation to interested residents. Newspaper racks are ideal because they keep the papers organized and the space clutter-free.	176
Figure 60: Kahala Nui incorporated underground parking into their design. This allowed them to create a large park space on their property.	179
Figure 61: Ideal proximity diagram showing walking distances from the facility to nearby components.....	182
Figure 62: By using site analysis features within Revit Architecture, architects and designers can gain a general understanding of how the sun will affect the building as well as the general direction of the prevailing winds. The diagram above is an example of a building showing sun and wind direction from the summer through winter equinox.	184
Figure 63: Examples 1 and 2 are images of two different entry façades of The Plaza Assisted Living facilities that successfully break down the scale of the building. The buildings also blend into the surrounding neighborhoods well. Example 3 does not resemble a home but does incorporate trees and vegetation to break down the scale of the building.....	186
Figure 64: Placing bird feeders in unique places can promote visual stimulation.	192
Figure 65: An environmental diagram showing different local plants and materials that can in the design of a wandering garden.....	193
Figure 66: Sun shade sails can span large distances. Sails are constructed of HDPE fabric that allows a limited amount of light through.	194

Figure 67: Cut-a-way of a permeable paver	196
Figure 68: Examples of good and bad pavers and paving materials for wheelchair accessibility.	197
Figure 69: An example of a Trex Outdoor Furniture bench that has the appearance of a typical wooden bench.	199
Figure 70: Examples of how a perimeter fence can feel too institutional.	201
Figure 71: Examples of how landscaping can camouflage the perimeter fence.	201
Figure 72: An octagonal picnic table with umbrella on brick pavers make for a welcoming place for family members to gather.	202
Figure 73: Examples of different wall types that can help mitigate sound transfer.	206
Figure 74: 1) Dow Rigid Insulation, 2) Batt Insulation, and 3) Spray Foam Insulation are three different types of insulation that offer different acoustic and workability properties.....	207
Figure 75: The top row shows examples of ceiling materials and finishes to avoid in a Dementia Care Facility. The bottom row shows acceptable ceiling materials and finishes.....	209
Figure 76: Above are three examples of window treatments—1 , 2 , and 3 —that can be used in a Dementia Care Facility. It is important to pay attention to the shadows that these create. As Alzheimer's disease progresses, a person will start to hallucinate more of	215
Figure 77: Vertical shading devices can effectively block the sun on the northern and southern facades.....	216
Figure 78: Horizontal shading devices can effectively block the sun on the western and eastern facades.	216
Figure 79: By understanding the meaning of colors and their psychological effects on people, architects and designers can make better color decisions.	219
Figure 80: The pictures in the top row are an example of poor pattern and texture choices, which can further confuse a dementia resident's comprehension of space. As the ability to perceive colors fades, contrast is vital. The bottom pictures show a better use of patterns in design; the floor clearly contrasts with the casework.....	221
Figure 81: The photo on the left is an example a pattern that is too bold for a Dementia Care Facility; the second is an example of texture that is acceptable.	222
Figure 82: Cross Ventilation Diagram of the Manoa Cottage in Kaimuki.	224
Figure 83: An example of how an accordion door links two spaces and allows natural light and air into a facility.	226

Figure 84: Above are two examples of corridor designs. A single loaded corridor connected to the outside can be wider for easier navigation and can help residents find their way by allowing more natural light into the facility.	229
Figure 85: The Plaza Assisted Living facilities utilize cul-de-sacs or a room cluster design to help create a more neighborly environment. The looped handrails in the hallways provide a path for residents to wander along safely.	230
Figure 86: A visual cue can be as simple as a shadowbox next to a bedroom door. When creating a shadowbox, make sure it does not protrude more than 5 inches from the wall to keep it from being a hazard to passersby. .	232
Figure 87: Simple placard signs that illustrate clear text, a symbol, and a color can help residents find their way throughout the facility.	233
Figure 88: Hawai'i streets signs are another type of visual cue that many local residents may recognize. Placing these types of signs in the hallways may assist residents in navigating the facility.	234
Figure 89: Signage made according to ADA height and location specifications.	236
Figure 90: The bold dashed lines form the shape of a racetrack, an example of Will Perkins' recommendation. This method is more efficient because it reduces travel distances and provides a larger open floor plan.	238
Figure 91: The Plaza Assisted Living at Moanalua uses a secured elevator lobby to prevent residents from wandering off the property.	239
Figure 92: The recommended dimensions of a chair.	241
Figure 93: A table and chairs with a dark stain finish that contrasts with the floor.	242
Figure 94: Illustration showing recommended chair elements; feet should rest firmly on the floor and arms should rest comfortably on the armrest.	243
Figure 95: Examples of inconspicuous security systems that can be implemented in resident bedrooms: 1) a PA System that is connected to the nurses' station; 2) a miniature motion sensor that notifies the nurses if the resident is trying to wander; 3) a pressure mat that is wired to the nurses' station, which also disguises as a regular mat underneath; and 4) a silent door sensor that alerts the nurses if a resident tries to wander.	245
Figure 96: The Plaza Assisted Living at Moanalua provides a secure area on the memory care floor where residents can wander freely.	247
Figure 97: A skylight can flood a room with indirect light creating less glare than a regular window.	250
Figure 98: To create proper daylighting, the ceiling must be set above the dashed line.	251
Figure 99: 1) These doors are ideal for residents because they offer both safety and a homelike appeal. 2) This double door is ideal for semi-private resident rooms. 3) These doors may feel institutional, but can be used in restricted-	

access BOH areas. 4) This typical double door can be used in areas that link outdoor and indoor spaces.	253
Figure 100: ModernFold Acousti-Clear glass is a glass partition that comes with acoustical properties. This product would be great for a care facility where because it provides acoustic control while allowing agitated residents to see the activities within.	254
Figure 101: Example 1 is an ideal door handle for residents with arthritis because it requires less hand movement and dexterity to operate. Avoid examples two and three; both are difficult for arthritic hands to operate and can be a source of daily anxiety for res.....	255
Figure 102: Entrance to the BIA-Hawai'i training facility. The handicap ramp is behind the sign and foliage. Photo taken from Google Earth.	295
Figure 103: The sock with tennis ball over my hand represents a handicapped person with arthritis. Photo taken by Norma Hara.	297

Preface

The driving force behind this research stems from a personal event that happened before the start of this project. I was introduced to and became interested in dementia care design in Skilled Nursing Facilities (SNFs) when my grandpa, to whom this dissertation is dedicated, was moved into one to receive rehabilitation therapy after spending a few weeks in the hospital.

When our family first received word that he was going to receive care from an SNF in Kalihi, we began to research the facility. Much like any family would do, we asked around to find out what others had to say about the facility and we received mixed reviews. Upon arriving at the facility for the first time, our impression was that we were about to leave my grandpa in a giant old house shared by other older adults.

When we visited his room, we were not impressed with the environment. The room was semi-private with a communal restroom shared by four residents. There was a simple rickety wooden cabinet for his clothes and a fairly old nightstand near his bed. The walls were painted both white and yellow and a set of curtains covered the sliding door that opened to the outdoor lanai area. The corridors had noticeable stains, vinyl tile flooring material that looked like it was laid in the 80s, and worn brown carpet that covered the main pathways through the corridors.

The environment we were leaving him in was unsightly, to say the least. During his time at the facility, the list of things that caused my grandpa discomfort continued to grow. I spoke to the family members of other residents and all of them described the same sentiment: “The environment that my loved one is in sucks.” They also agreed that the care the nurses provided was not of a high quality.

There were several other things I noticed during my grandpa’s stay. His room was in direct afternoon sunlight every day. The smell that the air conditioner gave off was moldy and musty. The air conditioner was always either

too cold or too warm. It was difficult to find my way around the facility and the facility's overall feeling was institutional and gloomy.

After my grandpa's passing, I felt inspired to take a closer look at the architecture of SNFs in general to see if I could identify ways to revitalize the designs behind the older ones to create livelier, brighter, safer, more cheerful environments that both the residents and families would feel comfortable with and enjoy. This led to several small projects that eventually led to the start of this dissertation. The following research allowed me to identify the information I needed to help me understand potential design improvements that can be made to such facilities.

Although my grandpa did not have Alzheimer's disease or dementia, I have chosen this as the focus for my project because of the evident lack of development and support in this area of care facilities.

Part 1: Research

Chapter 1: Introduction

The United States Census Bureau reports that in 2010 over forty million Americans were 65 years or older.¹ More than five million people within this age group currently suffer from Alzheimer's disease or some other form of dementia.² Almost two-thirds of these are women.³

The Census Bureau estimates that by 2050, there will be over 87 million adults over the age of 65, more than two times the 2010 estimate⁴ and, according to the Alzheimer's Association website, the number of people "with Alzheimer's disease may nearly triple, from 5.1 million to a projected 13.8 million, barring the development of medical breakthroughs to prevent or cure the disease." The website also reports that dementia is the sixth overall leading cause of death in the United States, and the fifth leading cause of death for adults over the age of 65.⁵

Even though some small advances have been made in understanding how to better cope with dementia, no cure or methods of prevention have been discovered.⁶ As a result of this and the increasing population, the number of those affected by dementia continues to grow and thus the field of Alzheimer's disease and dementia patient care is facing mounting challenges, including a growing need for space, licensed practitioners, and funding. The state of Hawai'i

¹ Administration on Aging. 2010. "65+ Minority Population Comparison using Census 2000 and Census 2010." U.S. Population by Age. July. Accessed February 23, 2015. http://www.aoa.acl.gov/Aging_Statistics/Census_Population/census2010/Index.aspx.

² Alzheimer's Association. 2014. "Alzheimer's Facts and Figures." Alzheimer's Association. Accessed February 23, 2015. http://www.alz.org/alzheimers_disease_facts_and_figures.asp#quickFacts.

³ Ibid.

⁴ "Population Properties. 2014 National Population Projections: Summary Tables," US Census Bureau, Accessed April 2015, <http://www.census.gov/population/projections/data/national/2014/summarytables.html>

⁵ Alzheimer's Association. 2014. Alzheimer's Facts and Figures. Accessed February 24, 2015. http://www.alz.org/alzheimers_disease_facts_and_figures.asp.

⁶ Ibid.

faces similar challenges. Currently, its most critical need is for a greater allotment of space dedicated specifically to those with dementia.

In response to this need, a greater number of care facilities will begin to include dementia care in their offered services, new dementia care facilities will be built, and many more families will remodel their homes with the purpose of helping loved ones with dementia to age safely and comfortably in place. As the building needs grow alongside the population of those with dementia, architects, interior designers, building contractors, care facilities, and even families will need access to proper guidelines designed for building in Hawai'i that approach the subject of dementia care thoroughly and carefully.

Some states, such as California, have established guidelines for building such care facilities. However, even though Hawai'i is known for its care facilities built in and around nature with access to excellent air quality, mild weather, and beautiful views, the State has not set any standards or guidelines for building facilities specifically for the population of older adults with dementia.

The overall goal of this dissertation, then, is to create guidelines to assist with the future development of dementia care facilities in Hawai'i that specifically maintain the integrity and dignity of the older adults in care. The guidelines will be formulated based on available information on Alzheimer's disease and dementia as well as examples of existing care facilities in Hawai'i. While these guidelines are intended for building in Hawai'i, they will be universally applicable.

Organization

This dissertation is comprised of two major elements: the manuscript and the design project. Following is an overview and brief description of the project's organization:

Manuscript

Part 1: Research (Chapters 2 to 6)

1. Discussion of Alzheimer's disease and dementia

2. Investigation of existing design guidelines and concepts including Universal Design, building for assisted living, and Visitability
3. Description and classification of the most common types of dementia care facilities and services, and the presentation of a matrix of a majority of care facilities on the Hawaiian Islands
4. Explanation of several existing therapies known to ease the progression of Alzheimer's disease and dementia

Case Studies (Chapter 6)

Report of four Dementia Care Facility case studies detailing facility services and amenities, history, and surrounding community. The section concludes with a table summarizing and comparing the details of each facility and a discussion of the author's thoughts and impressions of each.

Part 2: Design Consideration

Presentation and explanation of the guidelines for building Dementia Care Facilities in Hawai'i

Certified Aging in Place Specialist (CAPS) (Appendix B)

Review and impressions of author's experience auditing a Certified Aging in Place Specialist (CAPS) training program taken to gain insight into how caregivers and older adults interact with each other and with their everyday environments

Design Project

A collection of illustrations of the design guidelines, portraying them graphically, making them accessible to healthcare providers, designers, and architects

Hawai'i State Population Figures

The two figures of tables below present past, current, and future forecasts of population numbers for the state of Hawai'i. The first figure is a table that lays out Hawai'i's total population compared to that of each county from 1980 to 2040 and includes average annual and projected average annual growth rates. The second figure compares total population to that of people 60 years and older and 85 years and older in Hawai'i from 1980 to 2035 with percentages and also shows overall percentage and number changes from the year 1980.

In the first figure, it is evident that each year, Hawai'i's population increases substantially and is predicted to continue to do so. The second figure indicates that from 1980 to 2035, Hawai'i's total population will more than double, increasing by a projected 65%. The figure also shows that in 1980, Hawai'i's population of adults over 60 years old made up 11.9 percent of the total, whereas in 2035, forecasts show that this population will make up 29.7 percent of the total, a 310 percent increase from 1980.

Table 1: Hawai'i residential population by county from 1980 to 2040.

Year	State Total	Hawai'i County	Honolulu County	Kauai County	Maui County
1980	968,500	92,900	764,600	39,400	71,600
1985	1,039,698	105,900	804,294	44,357	85,147
1990	1,113,491	121,572	838,534	51,676	101,709
1995	1,196,854	140,492	881,399	57,068	117,895
2000	1,213,519	149,244	876,629	58,568	129,078
2005	1,292,729	168,237	918,181	62,863	143,448
2010	1,363,621	185,406	955,775	67,226	155,214
2015	1,418,300	202,700	976,200	71,400	168,000
2020	1,481,200	220,900	1,003,700	75,600	181,000
2025	1,543,200	239,600	1,029,400	80,000	194,200
2030	1,602,300	258,500	1,052,100	84,400	207,300
2035	1,657,500	277,300	1,071,200	88,700	220,200
2040	1,708,900	296,300	1,086,700	93,000	232,900
Average Annual Growth Rate (%)					
1980-1985	1.4	2.7	1	2.4	3.5
1985-1990	1.4	2.8	0.8	3.1	3.6
1990-1995	1.5	2.9	1	2	3
1995-2000	0.3	1.2	-0.1	0.5	1.8
2000-2005	1.3	2.4	0.9	1.4	2.1
2005-2010	1.1	2	0.8	1.4	1.6
2010-2015	0.8	1.8	0.4	1.2	1.6
2015-2020	0.9	1.7	0.6	1.2	1.5
2020-2025	0.8	1.6	0.5	1.1	1.4
2025-2030	0.8	1.5	0.4	1.1	1.3
2030-2035	0.7	1.4	0.4	1	1.2
2035-2040	0.6	1.3	0.3	0.9	1.1

Source: Department of Business, Economic Development and Tourism. 2012. "Population and Economic Projections for the State of Hawaii to 2040." DBEDT 2040 Series. March. Table 1-1, 2. Accessed February 25, 2015.
http://files.hawaii.gov/dbedt/economic/data_reports/2040-long-range-forecast/2040-long-range-forecast.pdf.

Table 2: Hawai'i's population of adults 60 years and older and 85 and years and older. Forecasts are based on the Hawai'i DBEDPT projected 2035 population for Hawai'i of 1,598,700.

Age Group	1980	1990	2000	2010	2020	2025	2030	2035
Pop. x 1000								
Total 60 +	115.67	174.05	207.00	277.40	373.65	415.67	448.71	474.59
	11.9%	15.6%	17.1%	21.4%	26.1%	27.9%	29.0%	29.7%
# Change from 1980		58.38	91.33	161.73	257.98	300.00	333.04	358.92
% Changed from 1980		50.5%	79.0%	139.8%	223.0%	259.4%	287.9%	310.3%
Total 85+	5.69	10.22	17.56	30.27	42.76	45.37	54.61	71.55
% Total Pop.	0.6%	90.0%	1.5%	2.3%	3.0%	3.0%	3.5%	4.5%
# Change from 1980		4.53	11.87	24.55	37.07	39.68	48.92	65.86
% Changed from 1980		79.6%	208.6%	431.5%	651.5%	697.4%	859.8%	1598.7%
Total Pop.	968.50	1113.49	1211.48	1299.57	1432.54	1492.25	1547.46	1598.68
# Change from 1980		144.99	242.98	331.07	464.04	523.75	578.96	630.18
% Changed from 1980		15.0%	25.1%	34.2%	47.9%	54.1%	59.8%	65.1%

Source: Executive Office of Aging. 2011. "Hawai'i State Plan on Aging October 1, 2013 - September 30, 2015." Executive Office of Aging. October. Table 3, 13. Accessed February 26, 2015. <http://health.hawaii.gov/eoa/files/2013/07/Hawaii-State-Plan-On-Aging.pdf>.

Chapter 2: Alzheimer's Disease and Dementia

Alzheimer's Disease

Scientists and doctors believe there are a number of factors that can influence the onset of Alzheimer's disease. There are two abnormalities in the brain in particular that damage or kill brain cells, which have been observed in many individuals with Alzheimer's. The first abnormality is a plaque called beta-amyloid, which builds up between nerve cells. The second is the twisted fibers of a protein called tau, or tangles, which build up inside the cells. Although most people develop some plaque and tangles as they age, adults with Alzheimer's disease develop higher levels of both.

The most common type of dementia is Alzheimer's disease, most recognizable by a person's memory loss and inability to function in daily activities. Alzheimer's disease makes up 60 to 80 percent of all dementia-related cases. There is currently no cure for Alzheimer's disease, but doctors and other professionals in the field have come up with means of helping people cope using therapies such as music therapy and art therapy that can help slow the body's deterioration, which is discussed in more detail in chapter 5.

A majority of those affected by Alzheimer's disease are 65 years and older, but some are affected as early as their forties and fifties.⁷ This form is called early onset Alzheimer's disease. An example of this can be seen in the movie *Still Alice*, starring Julianne Moore, a story in which Moore's character, just after her fiftieth birthday, begins to experience the slow and painful deterioration process characteristic of early onset Alzheimer's disease.

Alzheimer's disease attacks the brain from multiple angles. First, the frontal lobe, which controls short-term memory, attention, planning, and motivation, is affected. During this time, the beta-amyloid plaque starts to attach

⁷ Alzheimer's Association. n.d. What is Alzheimer's? Accessed March 1, 2015. http://www.alz.org/alzheimers_disease_what_is_alzheimers.asp.

to nerve cells in the brain. The illustration in figure 1 shows how a normal brain functions when processing memory, or motor function. As Alzheimer's disease progresses, the plaque and tangles block these synapses, which causes the brain to lose its functions.

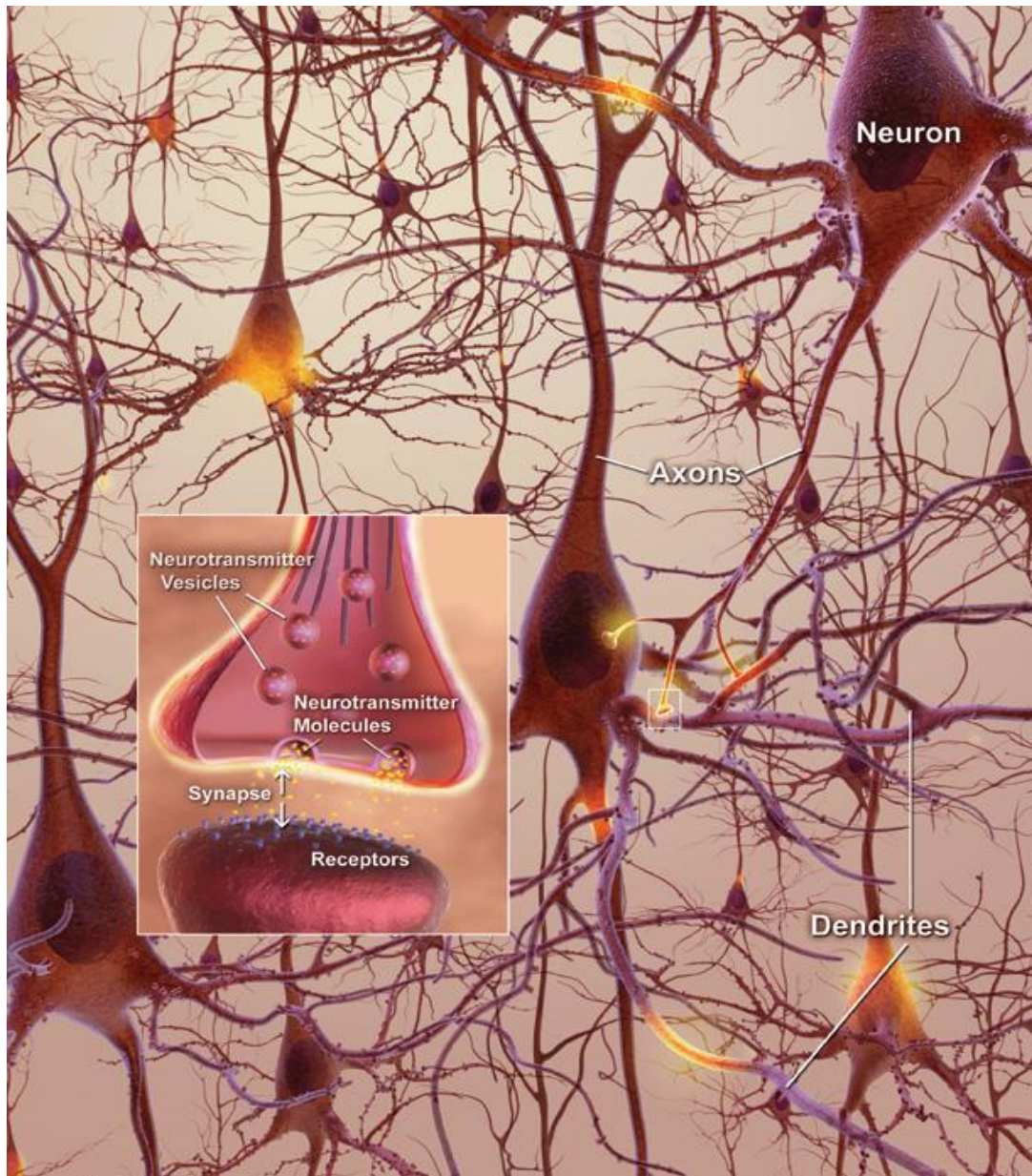


Figure 1: Image of a nerve cells being infected by beta-amyloid plaque.

Source: National Institute on Aging. n.d. "Scientific Images." US Department of Health and Human Services. Accessed March 26, 2015.
<http://www.nia.nih.gov/alzheimers/scientific-images>.

The second part of the brain that starts to deteriorate is the temporal lobe. This portion of the brain controls speech, behavior, longer-term memory, hearing, vision, and emotions.

The third part of the brain to deteriorate is the parietal lobe. This portion of the brain controls a person's ability to reason, their intelligence, language, sensation, and reading abilities. Pamela Scott, the Alzheimer's Association Oahu Program Coordinator who teaches the public about Alzheimer's disease and provides help to families and caregivers, explained at a lecture that it is best not to argue with a person with more advanced Alzheimer's disease. A non-affected person is able to use his or her reasoning portion of the brain, but someone affected by Alzheimer's disease may not be able to. By agreeing with him or her instead of arguing, the person affected will experience less agitation and aggression.⁸

⁸ Scott, Pamela. "Behavioral." Lecture, Alzheimer's Association Hawai'i Chapter, Honolulu, HI, March 26, 2015.

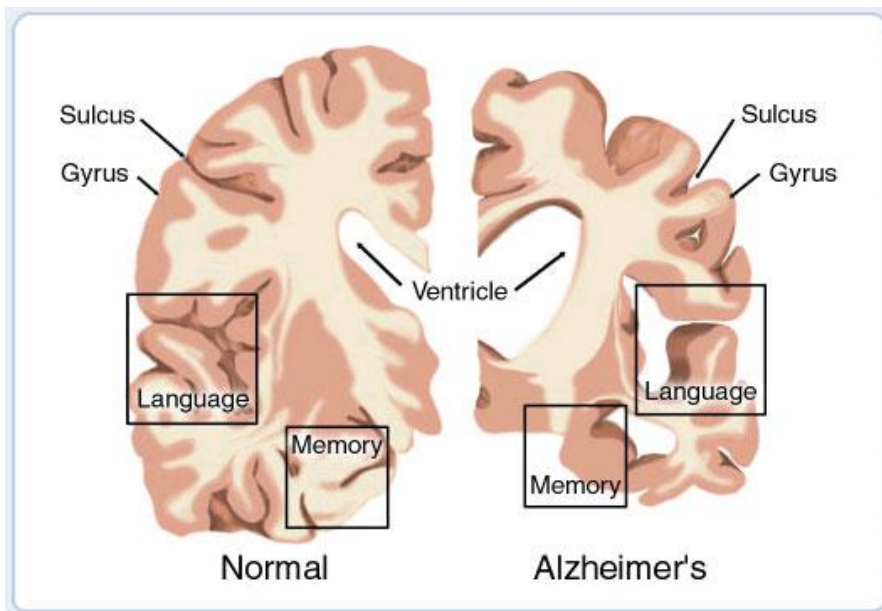


Figure 2: Cross sections of the brain comparing a normal brain to one of an Alzheimer's patient with locations of different functions labeled. Source: Scott, Pamela. "Behavioral." Lecture, Alzheimer's Association Hawai'i Chapter, Honolulu, HI, March 26, 2015.

The fourth part of the brain that deteriorates is the occipital lobe. When a person goes through this stage, he or she no longer sees the world in three dimensions; the world becomes two-dimensional. This means that contrasting colors such as black and white are perceived differently—white is perceived as a solid background while black is perceived as a hole.⁹

The final part of the brain to deteriorate is the brain stem. This portion of the brain controls a person's ability to breathe and swallow, and his or her heartbeat and blood pressure. The figure below is an example comparing a normal brain to that of a person in advanced stages of Alzheimer's disease.

⁹ Ibid.

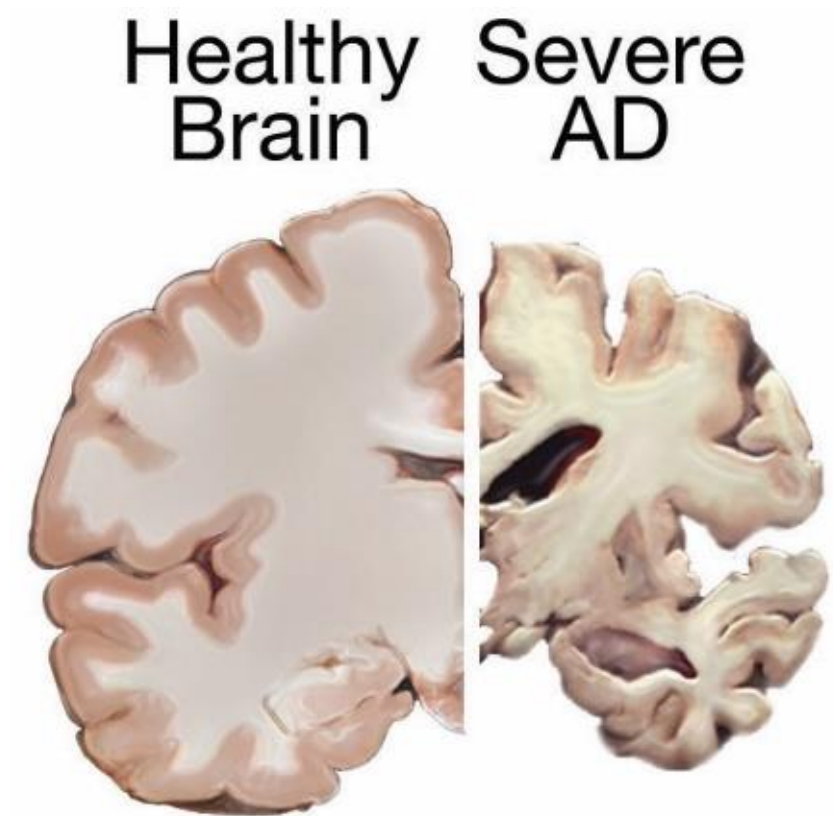


Figure 3: Cross sections between a healthy brain versus a brain with severe Alzheimer's Disease.

Source: National Institute on Aging. n.d. "Scientific Images." U.S. Department of Health and Human Services. Accessed March 26, 2015.
<http://www.nia.nih.gov/alzheimers/scientific-images>.

Alzheimer's is a progressive disease, which means it grows, worsens, or spreads. Progressive diseases can last until serious debility, organ failure, or death. Some progressive diseases can be cured through treatment, some can only be slowed, and some, like Alzheimer's disease, are not significantly affected by treatments.¹⁰

¹⁰ Jacques, Erica. 2009. What Is a Progressive Disorder? May 11. Accessed March 1, 2015. http://pain.about.com/od/whatischronicpain/g/progressive_disorder.htm.

Stages of Alzheimer's Disease

Dr. Barry Reisberg, clinical director of the New York University School of Medicine's Silberstein Aging and Dementia Research Center, developed a seven-stage system that lays out the general progression of Alzheimer's disease.

The Alzheimer's Association website lists these stages:

- | | |
|----------------|------------------------------|
| Early stage | 1. No impairment |
| | 2. Very mild decline |
| | 3. Mild decline |
| Moderate stage | 1. Moderate decline |
| | 2. Moderately severe decline |
| Severe stage | 1. Severe decline |
| | 2. Very severe decline |

The following sections describe each of these stages in greater detail.

Stage 1: No impairment

A person is considered to function normally. He or she does not show any signs of cognitive difficulty or impairment.

Stage 2: Very mild decline

A person begins to undergo a very mild decline known as Mild Cognitive Impairment (MCI). At this stage, a person may start to notice memory lapses. The Mayo Clinic conducted a study that found that about 15 percent of older adults between the ages of seventy and ninety have MCI.¹¹ This impairment may be normal aging or it may be the earliest signs of Alzheimer's disease or some other form of dementia.

Dr. Ronald Petersen is the world's leading researcher in understanding the early signs of MCI. In a video discussing MCI on the Alzheimer's Association

¹¹Alzheimer's Research Center. 2014. "Mild Cognitive Impairment Research." Alzheimer's Research Center. Accessed March 1, 2015.
http://alz.org/research/video/alzheimers_videos_and_media_identifying.asp?_ga=1.165625209.711427970.1421783409.

website, Peterson describes two different forms of MCI.¹² One type is amnesic, or relating specifically to memory loss, which can lead to Alzheimer's disease down the road. The other is non-amnesic, which is instead recognized by difficulties in cognition including attention, concentration, language, and visual-spatial skills.¹³ This can also affect a person's navigational skills.¹⁴ This form of MCI tends to rule out Alzheimer's disease but often points to other forms of dementia including dementia with Lewy bodies, Frontotemporal dementia, or vascular dementia.¹⁵

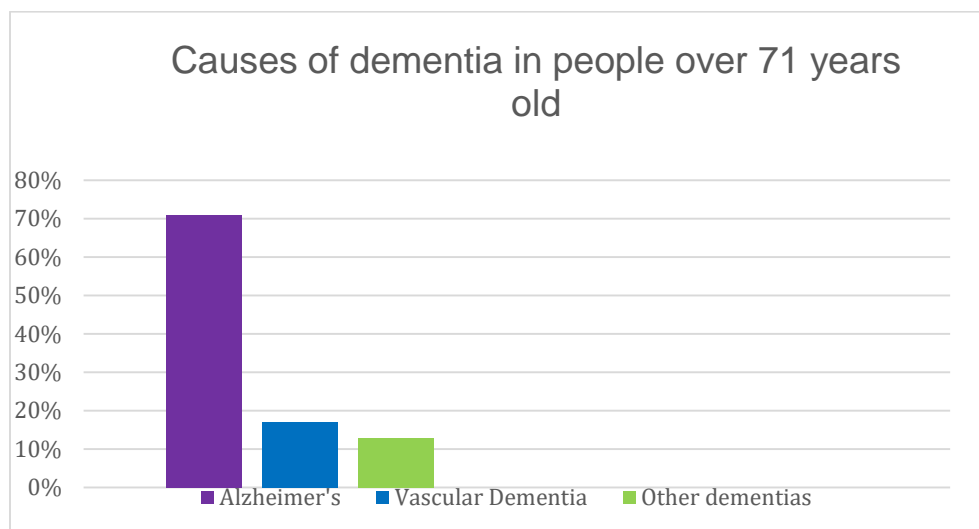


Figure 4: Percentages gathered from the video, "Mild Cognitive Impairment Research," on the Alzheimer's Association website.¹⁶

Source: Alzheimer's Research Center. 2014. "Mild Cognitive Impairment Research." Alzheimer's Research Center. Accessed March 1, 2015.

Stage 3: Mild decline

The next stage in dementia progression is mild cognitive decline. At this point in time, a person may start to notice an increase in memory loss. This person should contact his or her physician to undergo a set of memory tests as

¹² Ibid.

¹³ Ibid.

¹⁴ Ibid.

¹⁵ Ibid.

¹⁶ Ibid.

well as a PET (positron emission tomography) scan or MRI (magnetic resonance imaging) scan.

During this stage, a person might begin to have trouble remembering names or coming up with the right words.¹⁷ Also during this stage a person may start to misplace valuable objects without knowing it.¹⁸ He or she may also have a hard time planning and organizing future events.¹⁹ The following list was taken from the Alzheimer's Association website and lays out ten early signs and symptoms of Alzheimer's disease and dementia that will become visible during this stage:

1. Memory loss that disrupts daily life
2. Challenges in planning or solving problems
3. Difficulty completing familiar tasks at home, at work or at leisure
4. Confusion with time or place
5. Trouble understanding visual images and spatial relationships
6. New problems with words in speaking or writing
7. Misplacing things and losing the ability to retrace steps
8. Decreased or poor judgment
9. Withdrawal from work or social activities
10. Changes in mood and personality²⁰

Stage 4: Moderate decline

Stage four is the point at which Alzheimer's disease can be diagnosed. Similar to stage three, the signs in stage four become even more obvious and may include forgetting recent events or personal history as well as difficulty accomplishing challenging tasks such as performing complex arithmetic problems, taking care of personal finances, or planning dinners. A person

¹⁷ Alzheimer's Association. 2014. Seven Stages of Alzheimer's. Accessed March 2, 2015. http://www.alz.org/alzheimers_disease_stages_of_alzheimers.asp.

¹⁸ Ibid.

¹⁹ Ibid.

²⁰ Alzheimer's Association. 2014. 10 Early Signs and Symptoms of Alzheimer's. Accessed March 2, 2015. http://www.alz.org/alzheimers_disease_10_signs_of_alzheimers.asp#signs.

experiencing stage four may become moodier and start to seclude him- or herself mentally or socially.²¹

During this time, loved ones are encouraged to seek help. There are many resources available, though sometimes too much information can be initially overwhelming. The Alzheimer's Association's 24/7 helpline offers caregivers answers in a timely manner. The Association also provides monthly workshops for both professionals and non-professionals. These workshops normally take place at a local chapter's meeting room. The author spent time at the Honolulu chapter's headquarters where he was given information and resources on Alzheimer's and dementia.

Stage 5: Moderately severe decline

The fifth stage is when moderately severe cognitive decline can be observed. This is considered moderate or mid-stage Alzheimer's disease. During this phase, the person suffering from Alzheimer's disease will have gaps in his or her memory that will be noticeable to others. This person will most likely need a caregiver or loved one to assist with day-to-day activities, but will still be able to eat and use the restroom alone. He or she will likely not be able to recall information such as phone numbers, personal address, or schools attended in the past, and may have trouble remembering days or processing less challenging math problems.²²

The person may also have difficulty choosing proper attire for specific seasons or occasions but will still remember important details about his or her life.²³

Stage 6: Severe decline

The sixth stage is when severe cognitive decline is observed. At this point, it is considered moderately severe or mid-stage Alzheimer's disease. During this

²¹ Ibid.

²² Ibid.

²³ Ibid.

period, a person's memory continues to worsen, his or her personality may start to change, and he or she will require much assistance with daily activities.²⁴

During this stage, a person will begin to lose awareness of his or her surroundings and experience the sense of feeling lost. He or she might recognize familiar faces but forget the names of the people closest to him or her.²⁵

Among other things, those suffering from this stage of Alzheimer's disease may experience flipped sleeping patterns—sleeping during the day and feeling restless at night; they may begin to wander and become lost; they might have trouble controlling their bodily functions and need more help with basic toileting; and they may suffer from compulsive behaviors or delusions, such as mistaking a loved one for an imposter.

Stage 7: Very severe decline

The final stage in the progression of Alzheimer's disease is known as very severe cognitive decline (or severe or late-stage Alzheimer's disease). During this stage, a person will have difficulty communicating both verbally and physically. Although he or she may be able to speak, the words or phrases may come out jumbled or unclear. The person may need assistance in everyday activities such as eating, showering, bathing, and using the toilet. Muscles may begin to grow rigid and thus eventually a person may need assistance holding up his or her head.²⁶ During this phase, many also suffer from swallowing impairment.

This is the point at which it is recommended that family members or caregivers consider placing their loved ones in late-stage or end-of-life care. End-of-life care is hospice care, which can either be performed at home or at a facility, depending on the wishes of the family involved.

²⁴ Ibid.

²⁵ Ibid.

²⁶ Ibid.

Predicting Factors

According to the Alzheimer's Association, scientists have identified certain factors that predict a person's chances of developing Alzheimer's disease. Age is the first and greatest factor.²⁷ Statistically, one in nine people 65 years and older have Alzheimer's disease, while one in three people over the age of 85 do.²⁸ The second factor is family history. Research shows a person is at a higher risk of developing Alzheimer's disease if someone in his or her close family circle, such as a parent or sibling, has the disease. The third factor is familial Alzheimer's disease and genetics. According to "Basics of Alzheimer's Disease," a brochure put out by the Alzheimer's Association in 2014,

Two categories of genes influence whether a person develops a disease: risk genes and deterministic genes. Risk genes increase the likelihood of developing a disease but do not guarantee it will happen. Deterministic genes directly cause a disease, guaranteeing that anyone who inherits one will develop a disorder.²⁹

Researchers have discovered several risk genes for Alzheimer's disease. Gene type APOE-e4 is the first and strongest risk gene identified.³⁰ There are also other forms of the APOE gene and every person inherits a copy of one of these genes from each parent. Those who inherit two -e4 have a higher risk of developing Alzheimer's disease than those who inherit one or no -e4 genes. These are not deterministic, however. Less than one percent of Alzheimer's cases are caused by a deterministic gene, which usually causes the early onset type.³¹

There are ways to reduce one's chances of developing Alzheimer's disease. According to the National Institute on Aging (NIA), exercise and physical activity can protect the brain and delay or slow down loss of cognitive functions in

²⁷ Alzheimer's Association. 2014. "Basics of Alzheimer's disease." Accessed March 5, 2015. http://www.alz.org/national/documents/brochure_basicsofalz_low.pdf. 7.

²⁸ Ibid.

²⁹ Ibid.

³⁰ Ibid.

³¹ Ibid.

older adults. Researchers have found that exercise can increase nerve growth (protein) in humans, an important feature for memory and learning.³² Exercising for at least forty minutes every day can improve connectivity in the part of the brain engaged in daydreaming, envisioning the future, and recalling the past for older adults.³³ A number of studies show that a proper diet can also help a person's brain stay healthy. If older adults were to eat more fruits and vegetables and less refined foods, they would not only lower their risk of developing Alzheimer's disease but also lower their risk of developing many other chronic diseases.

Behavioral Issues

There are a number of behavioral issues that older adults with Alzheimer's disease, caregivers, and love ones are faced with on a daily basis, including anger and agitation; hallucinations; incontinence; bathing, dressing, and eating issues; sleeping issues; and wandering. Behavioral issues can have many different triggers. These can be physiological, medical, environmental, or unknown. Fortunately, neurologists have identified ways of recognizing triggers and possibly preventing the behaviors. The following sections list each major behavioral issue along with recommended coping techniques.

Anger and agitation

To minimize anger and agitation in older adults suffering from Alzheimer's disease, caregivers should identify any medical or physical problems the person has. It is also a good idea to minimize unnecessary confusion by keeping living areas clear of clutter and to keeping furniture in its place.

From an architectural standpoint, in care facilities, acoustics and thermal comfort are important areas of focus. Also, providing an area to allow Alzheimer's

³² National Institute on Aging. 2015. "Do Exercise and Physical Activity Protect the Brain?" National Institute on Aging. February 13. Accessed March 5, 2015. <http://www.nia.nih.gov/alzheimers/publication/preventing-alzheimers-disease/search-alzheimers-prevention-strategies#exercise>.

³³ Ibid.

residents to pace or wander is important as pacing can offer relief from anxiety or agitation.³⁴

Hallucination

When a person with Alzheimer's hallucinates, there are a number of possible causes including physical illnesses (fever, pain, or constipation), trauma, and medication side-effects. Hallucinations can also be triggered by changes in a person's environment. For example, a person may not recognize his or her surroundings or caregiver because he or she has been moved or a familiar object or person has been moved or is not present. Some coping strategies for dealing with hallucinations include seeking medical attention to rule out or resolve any physical illnesses, adjusting any medications that may need it, and taking steps to help relieve the person of any pain or discomfort he or she may be experiencing.

Shadows are seen as visual hallucinations to some.³⁵ From an architectural standpoint, adding more light fixtures or lamps to a space will reduce the amount of shadows and potential for hallucination.

Incontinence

As a person progresses through the stages of Alzheimer's disease, he or she experiences an increasing loss of motor skills. Over time, the person is less and less able to manage timing of bodily functions, losing the capacity to wait till he or she has reached the restroom, and eventually loses control altogether. Medication, fluid consumption, and chronic issues can all affect this regression. There are also controllable environmental issues that can negatively affect the situation. For example, people can soil themselves because they are too far from a restroom, because they have a hard time getting out of bed, or because the

³⁴ Robinson, Anne, Beth Spencer, and Laurie White. Understanding Difficult Behaviors. Ypsilanti: University of Michigan, 1989. (A1-A4)

³⁵ Bissonnette, Thomas. Hallucinations, Paranoia Practical Suggestions for Understanding Problem Behaviors. Edited by Anne Robinson, Beth Spencer and Laurie White. Ypsilanti: Eastern Michigan University, 1989. (B1-B4)

lighting in a restroom is too dim and they are unable to see. In public spaces, signage can be a source of confusion while in a care facility, the restroom stall guardrails may be an obstacle.

A caregiver should carefully observe any changes in the older adult's use of the restroom. The caregiver should contact the person's physician if urination frequency or quantity changes and should continuously communicate with the person about his or her toileting to resolve any issues before they worsen.

From an architectural standpoint, it is important to provide adequate lighting in the restroom and corridors.³⁶ Also, restrooms should contain aids such as raised toilets with padded toilet seats and grab bars to give the residents both the protection and comfort they need. Signs should be clear, plenty, and should properly indicate gender if gender-specific restrooms are relevant.

Bathing, dressing and eating issues

Bathing, dressing, and eating issues all share similar triggers. Physical environment has a lot to do with the comfort and safety of a person with Alzheimer's disease. Some of the triggers that consistently set issues off are poor lighting, improper room temperature, and uncomfortable acoustics. Over time, repeated triggering of these issues can cause physiological problems such as depression or physical illness, and may even exacerbate the side effects of medication. Luckily the physical and architectural aspects of these triggers are easily rectified.

For bathing, first consider the room temperature; make sure it is comfortable for the bather.³⁷ Second, allow the bather to adjust the temperature of the water; this can help ease him or her into bathing. Finally, provide adequate lighting and curtains to impart security and comfort.³⁸ These solutions should be considered on a case-by-case basis as different people react differently to water, temperature, and privacy.

³⁶ Ibid. C3-C4

³⁷ Ibid. D-1.

³⁸ Ibid.

For dressing, there are similar architectural solutions. By providing the Alzheimer's resident with adequate lighting, privacy, proper room temperature, and acoustical comfort, the dressing process can go smoother.

For eating, a caregiver may play soft relaxing music.³⁹ The soft music can help to create a calming atmosphere.⁴⁰ In the dining environment, it helps to provide smells that older adults may recognize. The smell of fresh cooking can also help stimulate the brain. At the dining table, keep the visual space simple and clear of patterns or colors often found on tablecloths and placements to minimize distractions and confusion.⁴¹ Having a small number of people around a table may also help reduce anxiety during the eating experience. This will also lead to a quieter environment.

Sleeping issues

For a person suffering from Alzheimer's disease, sleeping is often difficult. As stated earlier, as a person progresses through the different stages, he or she may begin to sleep during the day and feel restless at night. During the night, it is common for a person to wake up and wander through his or her facility or home. This can be a security issue if not properly addressed.

There are architectural features that can be installed and implemented to help keep a person with Alzheimer's disease safe at night. Some facilities issue security bracelets that track nighttime wanderers. The bracelets also prevent the wearer from using the elevators or leaving the building. Other facilities use closed circuit televisions to monitor the whereabouts of their residents.

³⁹ Ibid., F-2

⁴⁰ Alzheimer's Association. n.d. "Music Therapy Enhancing Cognition." Caregiver Tips & Tools. Accessed March 7, 2015.
http://www.alz.org/cacentral/documents/Dementia_Care_9-Music_Therapy_enhancing_cognition.pdf. 2.

⁴¹ Bissonnette, Thomas. 1989. Hallucinations, Paranoia Practical Suggestions for Understanding Problem Behaviors. Edited by Anne Robinson, Beth Spencer and Laurie White. Ypsilanti: Eastern Michigan University. F-2

Wandering

According to the Alzheimer's Association, 60 percent of people suffering from dementia will wander at some point. Wandering can happen through many of the different stages of Alzheimer's disease and is one of the most dangerous behavioral issues.⁴²

There are many varying causes of wandering, and everyone suffers differently. From a physiological standpoint, wandering can be caused from stress, a desire to exercise, changes in the brain, and the need to use the restroom.⁴³ From an environmental standpoint, wandering can be caused by confusion from one's environment, claustrophobia, the feeling of being lost, not seeing familiar faces, and other sensory issues. Some other causes may be forgetfulness of one's current activity or an attempt to find someone from the past.

One strategy when dealing with wandering is to allow a person to wander in a secure environment. Sometimes a simple nametag or door decoration can help residents find their way back to their rooms. The Alzheimer's Association, as well as other sources, recommends promoting some sort of daily physical activity to distract residents from wandering. Physical activity can also release stress and anxiety. The activities do not need to be too physical; they can be something as simple as walking or pacing, doing household chores, or playing a game. The recommended timespan for these activities is half an hour, depending on severity.⁴⁴

It is important that the wanderer can wander safely. By improving indoor features such as lighting and acoustics, residents will have an easier time finding their way at night back to their rooms. Older people require at least three times

⁴² Alzheimer's Association. 2014. "Wandering and Getting Lost." Alzheimer's Association. Accessed March 11, 2015.
http://www.alz.org/national/documents/brochure_behaviors.pdf.

⁴³ Robinson, Anne, Beth Spencer, and Laurie White. 1989. Understanding Difficult Behaviors. Ypsilanti: University of Michigan. H-1.

⁴⁴ Ibid, H-2

as much light as younger people.⁴⁵ Also, having a glowing digital clock in the room can help a person orient him- or herself at night.

It is also important not to raise one's voice when one is addressing a wanderer as this may agitate him or her and trigger a faster pace. It helps, rather, to use a slow and low tone of voice; this helps create a safe and secure environment.

Dementia

Dementia is an umbrella term. The Alzheimer's Association defines dementia as, "an overall term that describes a wide range of symptoms associated with a decline in memory or other thinking skills severe enough to reduce a person's ability to perform everyday activities."⁴⁶ For a person to be diagnosed with some kind of dementia, they must show serious impairment in at least two of the following core cognitive functions laid out on the Alzheimer Association's website:

- Memory
- Communication and language
- Ability to focus and pay attention
- Reasoning and judgment
- Visual perception⁴⁷

In the following section, different types of dementia are defined and discussed. These affect a wide range of population, from young adults to older adults.

⁴⁵ Ibid.

⁴⁶ Alzheimer's Association, n.d., What is dementia? Accessed March 17, 2015. <http://www.alz.org/what-is-dementia.asp>

⁴⁷ Alzheimer's Association, n.d., What is dementia? Accessed March 17, 2015. <http://www.alz.org/what-is-dementia.asp>

Types of Dementia

Vascular Dementia

Whereas Alzheimer's disease is often diagnosed in the early stages by memory loss, vascular dementia is recognized by visibly impaired judgment or inability to make decisions, plan, or organize. Vascular dementia is often developed due to brain injuries such as microscopic bleeding and blood vessel blockage. The location, number, and size of the brain injury determine how the individual's thinking and physical functioning are affected.⁴⁸

Dementia with Lewy Bodies (DLB)

People with dementia with Lewy bodies often have the memory loss and thinking problems common in Alzheimer's disease, but are more likely than people with Alzheimer's to have early symptoms such as sleep disturbances, well-formed visual hallucinations, and muscle rigidity or other Parkinsonian movement impairments.⁴⁹

Mixed Dementia

With mixed dementia, abnormalities linked to more than one type of dementia occur simultaneously in the brain. Recent studies suggest that mixed dementia is more common than previously thought.⁵⁰

Parkinson's Disease

Problems with movement are a common symptom early in the progression of Parkinson's disease. If dementia develops, symptoms are often similar to those associated with dementia with Lewy bodies.⁵¹

⁴⁸ Alzheimer's Association n.d. Types of Dementia. Accessed February 20, 2015. <http://www.alz.org/dementia/types-of-dementia.asp>.

⁴⁹ Ibid.

⁵⁰ Ibid.

⁵¹ Ibid.

Frontotemporal Dementia

Typical symptoms of frontotemporal dementia include changes in personality and behavior and difficulty with language. Nerve cells in the front and side regions of the brain are especially affected.⁵²

Creutzfeldt-Jakob Disease

Creutzfeldt-Jakob disease is a rapidly fatal disorder that impairs memory and coordination and causes behavior changes.⁵³

Normal Pressure Hydrocephalus

Symptoms of normal pressure hydrocephalus include difficulty walking, memory loss, and inability to control urination.⁵⁴

Huntington's Disease

Huntington's disease symptoms include abnormal involuntary movements, a severe decline in thinking and reasoning skills, irritability, depression, and other mood changes.⁵⁵

Wernicke-Korsakoff Syndrome

Memory problems may be strikingly severe with Wernicke-Korsakoff syndrome while other thinking and social skills seem relatively unaffected.⁵⁶

⁵² Ibid.

⁵³ Ibid.

⁵⁴ Ibid.

⁵⁵ Ibid.

⁵⁶ Ibid.

Chapter 3: Existing Therapies

According to researchers, non-pharmaceutical therapies have the potential not only to provide comfort to a person suffering from Alzheimer's disease but also to help minimize and ease symptoms or even possibly slow the progression.⁵⁷ Some common therapies include art and music therapy, Namaste care, aromatherapy, bright light therapy, and simulated presence therapy.

Two more common types of therapy that are known to help those with Alzheimer's disease are Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (IADL). Some examples of ADLs are bathing, showering, dressing, eating (chewing and swallowing), mobility, personal hygiene, and using the toilet. Some examples of IADLs are housework, taking medication, managing money, shopping, driving, and communicating with others via telephone or computer.

Music and Art Therapy

Physical hands-on activities, such as music and art, have been shown to reduce agitation and improve behavioral issues of adults in the middle stages of Alzheimer's disease. Music and art provide a way of connecting with others. According to the Alzheimer's Association, music can be a powerful tool because it can shift moods, manage stress-induced agitation, stimulate positive interactions, facilitate cognitive function, and coordinate motor movements.⁵⁸ Music is also useful because it does not require a great amount of cognitive or mental function.⁵⁹

In order to maximize the music therapy experience, it is best to choose music that is familiar and enjoyable to the resident and if possible, let him or her

⁵⁷ Alzheimer's Association. 2014. Treatments for Alzheimer's disease. Accessed April 17, 2015. http://www.alz.org/alzheimers_disease_treatments.asp.

⁵⁸ Ibid.

⁵⁹ Ibid.

choose the songs.⁶⁰ By selecting music from a resident's younger years (ages 18 to 25), the resident is more likely to experience a stronger connection.⁶¹ Playing music that is unfamiliar may increase confusion and agitation. Along with singing to the music, encourage the resident to dance or clap. This type of engagement is good for the mind and body.

Music therapy can be effective throughout the different stages of dementia. Following is a list of ways to incorporate music therapy into everyday living in each set of stages:

Early Stages

- Encourage the person to dance.
- Let the person listen to music that is pleasing. Always let them select the music; music can sound different to a person with dementia.⁶²
- Encourage the person to play an instrument. If he or she played an instrument in his or her youth, encourage the same instrument.
- Compile a set of songs that can trigger happy memories.

Middle Stages

- Play or sing as the person walks. It can help improve balance and gait.⁶³
- Play background music to help set the person's mood.
- Play relaxing sounds such as the sound of rain, the ocean, or birds chirping; this may help the person to relax.

Late Stages

- Play the compilation of songs a person chose in earlier stages.
- Sing with the person.
- Play relaxing sounds such as the sound of rain, the ocean, or birds chirping.
- Incorporate music into daily exercise.

⁶⁰ Ibid.

⁶¹ Alzheimer's Foundation of America. 2015. Accessed April 18, 2015.
<http://www.alzfdn.org/EducationandCare/musictherapy.html>.

⁶² Ibid.

⁶³ Ibid.

- Have the person engage in clapping or drumming during his or her daily activities.
- Use facial expressions to communicate feelings when involved in music-related activities.⁶⁴

Like music, art can be a tool for communication for those with Alzheimer's disease. In many of the care facilities the author visited during the course of research, some form of art class was provided for residents. According to the Alzheimer's Foundation of America, art therapy is more effective in small groups.⁶⁵ Engaging in art therapy can also help people "recover the use of motor skills in the same manner as physical rehabilitation."⁶⁶

Below are some of the ways art can be effective:

- Keep the activity simple. Have the older adult draw, paint, or sculpt something that is familiar to them such as a star or a snowman. If they have talent, suggest something a little bit more challenging.
- Use materials that are non-toxic in case someone swallows something. If at all possible, use homemade clay or paints rather than store bought products. Use only tools that cannot inflict pain.
- As the person progresses further in the stages of dementia, offer different activities such as papier-mâché or crocheting.
- Provide a soothing environment with good lighting so the person can see what they are doing. Also, it may help to provide soothing background music.
- Always provide positive reinforcement.
- If the person is still verbal, have him or her talk about the art. This can also encourage the recall of memories.
- Create a gallery of the artwork. Not only can it make a person feel good, but it can also make a care facility feel more like home.

⁶⁴ Ibid.

⁶⁵ Alzheimer's Foundation of America. 2015. Education and Care. Accessed April 18, 2015. http://www.alzfdn.org/EducationandCare/art_therapy.html.

⁶⁶ Ibid.

Namaste Care

In Hindi, Namaste means to honor the spirit within, to look beyond the surface into the true nature of every being, and to honor the sacredness and equality in everyone.⁶⁷ Namaste care, created by a registered nurse named Joyce Simard, is an end-of-life therapy used to help comfort older adults as they progress through the last stages of dementia and life. It focuses on stimulating sensory skills.

Namaste care usually takes place in a room with a view of nature, calming paint colors on the walls, a comfortable temperature, and soothing music or natural sounds playing in the background. The room contains comfortable reclining sofas where residents are massaged.

In order for Namaste care to be effectively incorporated into a care facility, several important considerations must be addressed, including planning, space, staffing, and communications.

Planning

The care facility should incorporate Namaste care into the regular monthly activities as a coping activity. This activity should be discussed with the staff members as well as the family members of the resident involved in this care type. Family members can help their loved ones understand what is going on.

Space

The care facility should designate a private space where the Namaste therapy sessions can take place. This space should be constructed to be tranquil and peaceful.

⁶⁷ Alzheimer's Disease International. 2012. Namaste Care For End-Stage Dementia Care. October 2. Accessed April 19, 2015. <http://www.alz.co.uk/icanill/library/namaste-care-for-end-stage-dementia-care>.

Staffing

The care facility should choose staff members with prior training in therapeutic massage and other such therapies to run the Namaste care program.

Communication

The care facility should work closely with family members and staff to make sure everyone is comfortable with and educated about Namaste care and the activities involved. There should be an open policy in place where the family has a right to stop treatment if their loved one feels uncomfortable.

In Hawai'i, two facilities offer Namaste care—Hale Nani Rehabilitation and Nursing Center and Manoa Cottage in Kaimuki.

Aromatherapy

Aromatherapy is the therapeutic use of oils to help stimulate memory and to help calm. Oils can be applied directly to the skin, added to a bath, or placed heated or non-heated strategically in a room or environment.

Bright Light Therapy

Older adults may suffer from sundowning as they progress further into dementia. Sundowning is a psychological disorder that is associated with the confusion and restlessness related to one's wake-sleep cycle where a person becomes restless at dusk and may remain so throughout the night. Bright light therapy shows promise in helping to minimize nighttime restlessness. During a bright light therapy session, "a person sits in front of a light box that provides about 30 times more light than the average office light, for a set amount of time each day."⁶⁸

⁶⁸ Alzheimer's Society: Dementia Care and Research. 2005. "Non-pharmacological therapies for the treatment of behavioural symptoms in people with dementia." January. Accessed April 19, 2015.
http://www.alzheimers.org.uk/site/scripts/download_info.php?fileID=271. p 5.

Simulated Presence Therapy

Simulated presence therapy helps to calm a person with dementia by providing recordings of stories from his or her past. Family members and friends make videos, slide shows, or audio recordings relating memories of that person's life. The person may then listen to and watch these even when family and friends are not present. Such recordings, in a care facility setting, provide information about residents' lives to the staff, allow families to interact with a resident even without being present, and offer a very personal grounding and peace to the residents' lives that other therapies cannot provide.⁶⁹

⁶⁹ Ibid., p 7.

Chapter 4: Dementia Care Facility Types

What is a Dementia Special Care Unit?

A dementia Special Care Unit (SCU) is a unit within a nursing home that specializes in meeting the needs of people with dementia. Because of the growing number of older adults with Alzheimer's disease, SCUs are one of the fastest growing businesses in the nursing home field. Unfortunately, due to this growth spurt, many of the existing units do not meet any specific standards beyond what is regulated for a normal nursing home. According to the Alzheimer's Association, many facilities use the term SCU as a marketing scheme but offer almost no differences in care, services, support, or physical environment from their normal units.⁷⁰

In 1993, the Alzheimer's Association conducted a study to see how SCU services differed from those of traditional nursing homes. The website lists the following conclusions from this study:

- Extra costs of the units were not disclosed prior to admission 39 percent of the time.
- Twenty-nine percent of families did not know if they were paying more for special care than for standard nursing home care.
- Ombudsmen and state surveyors expressed concern about the availability of specialized activities, numbers of staff on duty, staff training, involuntary seclusion or confinement of residents, and the ability of the units to manage problem behavior.⁷¹

Since the completion of the study, the Alzheimer's Association has worked closely with state lawmakers to ensure that quality of life (QOL) standards are met in SCUs. Also since that time, twenty-three states have passed SCU disclosure laws.

⁷⁰Alzheimer's Association. 2014. Special Care Units. Accessed 23 March, 2015. http://www.alz.org/join_the_cause_special_care_units.asp.

⁷¹ Ibid.

Other Types of Nursing Facilities

Along with dementia SCU's, there are other types of facilities that can accommodate the needs of older adults. In Hawai'i, there are at least eight different types of facilities, including Adult day care, Assisted Living Facility, Adult Residential Care Home, Continuing Care Retirement Community, Community Care Foster Family Home, Intermediate Care Facility, Skilled Nursing Facility, and Respite Care. Each of these is described in the following sections.

Adult Day Care (ADC)

Adult day care (ADC) or adult day service offers part- or full-time care in a group setting. ADC is an appropriate choice for those who are unable to stay at home alone, even for short periods. ADC offers supervised care within a safe and secure environment. It may be community- or facility-based. Services typically include meals, social or recreational activities, and health-related assistance.⁷²

Assisted Living Facility (ALF)

An Assisted Living Facility (ALF) is a long-term care option that combines housing, support services, and health care, as needed. Assisted living is designed for individuals who require assistance with everyday activities such as meals, medication and medication management, bathing, dressing, and transportation. Some residents may have memory disorders such as Alzheimer's disease, or they may need help with mobility, incontinence, or other challenges. Residents are assessed upon move-in and any time there is a change in condition. The assessment is used to develop an Individualized Service Plan.⁷³

⁷² 2008. Types of Care. October 3. Accessed 1 2015, February. <http://careconversations.org/types-care>.

⁷³ Assisted Living Federation of America. 2013. What is Assisted Living? Accessed March 19, 2015. http://www.alfa.org/alfa/Assisted_Living_Information.asp.

Adult Residential Care Home (ARCH)

An Adult Residential Care Home (ARCH) is a home for older adults that has at least seven beds. The home must provide twenty-four-hour supervision and personal care services such as bathing, dressing, and grooming. ARCHs are not required to have nurses on duty on the premises.⁷⁴

Continuing Care Retirement Community (CCRC)

A Continuing Care Retirement Community (CCRC) is a retirement community with accommodations for independent living, assisted living, and nursing home care, offering residents a continuum of care. A person can spend the rest of his life in a CCRC, moving between levels of care as needed. People in the older adult housing industry call this "aging-in-place" even though it requires leaving one's original residence.⁷⁵

Community Care Foster Family Home (CCFFH)

A Community Care Foster Family Home (CCFFH) enables individuals needing care in an intermediate care facility (ICF) or a skilled nursing facility (SNF) to remain in a home setting as part of a family. Not only does this deter institutionalization, but the cost of care in a CCFFH is more reasonable than in an ICF or SNF.⁷⁶

Intermediate Care Facility (ICF)

An Intermediate Care Facility (ICF) is a health facility that provides medical services to those with a variety of physical or emotional conditions that require institutional facilities but without the degree of care provided by a hospital

⁷⁴ J, Triangle. 2010. Opening a Family Care Home. Accessed January 30, 2015.

<http://www.tjaaa.org/opening-a-family-care-home.aspx>.

⁷⁵ A Place For Mom. 2014. Continuing Care Retirement Communities. January 4.

Accessed March 19, 2015. <http://www.aplaceformom.com/senior-care-resources/articles/continuing-care-retirement-communities>.

⁷⁶ State of Hawaii Human Services. 2010. "Community Care Foster Family Homes." Community Care Foster Family Homes. January 6. Accessed March 20, 2015.

<http://humanservices.hawaii.gov/ssd/files/2013/01/CCFFH-Factsheet-1.6.10.pdf>.

or SNF. An example of an ICF is a care facility for mentally retarded individuals or other developmentally-disabled persons.⁷⁷

Skilled Nursing Facility (SNF)

A Skilled Nursing Facility (SNF) is the term for a nursing home, which is the fullest form of care for older adults. An SNF provides in-house medical care, physical therapy, and custodial care, which includes among other things assistance with feeding, bathing, and dressing. It is important to keep in mind that SNFs are usually quite costly, depending on the state, and Medicare only covers limited stays. Skilled nursing or rehabilitation services are covered for a period of about 100 days after a hospitalization but Medicare will not cover custodial care if this is the only care needed.⁷⁸

Respite Care (RC)

Respite care (RC) is a service that gives regular caregivers a temporary break from caregiving. Respite care can be provided in one's home by friends or family, by trained in-home care professionals, or in a care setting such as an adult day care or other similar facility.⁷⁹

Comparison of the Dementia Care Facilities in Hawai'i

This dissertation examines dementia care in an SNF setting to understand the overall state of care of dementia residents in Hawai'i and to identify a set of architectural guidelines for designers, architects, and SNFs building or remodeling specifically for dementia care. A member of the state Executive Office on Aging (EOA) explained that currently (March 2015), no regulated

⁷⁷ Mosby's Medical Dictionary, 8th edition. S.v. "intermediate care facility." Retrieved March 19 2015 from <http://medical-dictionary.thefreedictionary.com/intermediate+care+facility>

⁷⁸ Helpguide.org. n.d. A Guide to Nursing Homes. Accessed March 19, 2015. <http://www.helpguide.org/articles/senior-housing/guide-to-nursing-homes.htm>.

⁷⁹ Alzheimer's Association. 2014. Respite Care. Accessed March 19, 2015. <http://www.alz.org/care/alzheimers-dementia-caregiver-respite.asp>.

mandates exist for the treatment and care of older adults with dementia in nursing facilities in Hawai'i. However, by the year 2025, the EOA hopes to impose the Hawai'i 2025 plan. This plan is a blueprint created to greatly improve the way individuals with Alzheimer's disease and Related Dementia (ADRD) and their families will live in their communities and be served by their institutions.⁸⁰

The following table (see table 3) combines the Alzheimer's Association's table on Alzheimer's care with the EOA's table to determine which facilities in Hawai'i offer basic dementia care and which do not. The categories are chosen based on the Alzheimer's Association information and include the name of each facility, the facility type, whether a resident can wander, whether Medicaid is accepted, and the facility's location.

The table includes both skilled nursing facilities and intermediate care facilities. Each facility offers similar amenities, while some specialize in specific areas of need. This list is not exhaustive but representative. Each facility listed in the table was contacted to confirm the information and to find out whether Medicaid is accepted and whether wandering is allowed.

The table shows that out of the 58 facilities in Hawai'i included in this table, 37 accept Medicaid and 31 accept older adults who wander along with 8 more that will consider adults who wander case-by-case.

Table 3: Skilled Nursing and Intermediate Care Facilities in Hawai'i.

Facility Name	Type of Facility	Wandering	Medicaid	SCU	Location
15 Craigside	ALF/CCRC	Yes	No	X	Honolulu
ACTG Gallegos Inc.	CCRC	Yes	No	X	Honolulu
Aloha Nursing & Rehab Centre	NF	No	Yes		Kaneohe
Ann Pearl Nursing Facility	ALF	Yes	Yes	X	Kaneohe

⁸⁰ Aging, Executive Office on. 2013. "Hawai'i 2025: State Plan on Alzheimer's disease & Related Dementia." December. Accessed March 21, 2015.
http://www.hawaiiadrc.org/Portals/_AgencySite/docs/ADRD_rev.pdf , 4.

Facility Name	Type of Facility	Wandering	Medicaid	SCU	Location
Arcadia Retirement Residence	ALF/CCRC	Yes	No	X	Honolulu
Avalon Care Center	SNF	No	Yes		Honolulu
Convalescent Center of Honolulu	NF/SNF	Yes	Yes		Honolulu
Garden Isle Healthcare	SNF/ICF	Case-by-case	Yes		Lihue
Hale Anuenue Restorative Care Center	SNF/ICF	No	Medicaid only for ICF		Hilo
Hale Ho Aloha	ICF/SNF	No	No		Honolulu
Hale Ho'ola Hamakua	Critical Care Hospital	Case-by-case	Yes		Honokaa
Hale Ku'ike	ARCH	Yes	No	X	Honolulu/ Kaneohe
Hale Kupuna Heritage Home, LLC	SNF/INF	Yes	Yes		Koloa
Hale Makua Health Services	NF/SNF	Yes	Yes		Kahului
Hale Makua Health Services	NF/SNF	Yes	Yes		Wailuku
Hale Malamalama	NF/SNF	Yes	Yes		Honolulu
Hale Ola Kino – One Kalakaua	CCRC/RC/ SNF	No	No	X	Honolulu
Hale Nani Rehabilitation and Nursing Center	NF/SNF	Yes	Yes		Honolulu
Hale Nohea Maunalani	ARCH	Yes	No	X	Honolulu
Harry And Jeanette Weinberg Care Center	NF/SNF	No	Yes		Kaneohe
Hi'olani Care Center - Kahala Nui	CCRC	No	No	X	Honolulu
Hilo Medical Center	ICF/NF/SNF	Case-by-case	Yes		Hilo
Hospice Hawaii, Inc.	SNF	No	No		Honolulu
Island Nursing Home	NF/SNF	Yes	Yes		Honolulu

Facility Name	Type of Facility	Wandering	Medicaid	SCU	Location
Ka Punawai Ola	NF/SNF	Yes	Yes		Kapolei
Kahuku Medical Center	NF/SNF	No	No		Kahuku
KFH – Malama Ohana Nursing & Rehab Center	Hospital	Case-by-case	Yes		Honolulu
Ka'u Hospital	Hospital	No	No		Pahala
Kauai Care Center	ICF/SNF	No	Yes		Waimea
Kauai Veterans Memorial Hospital	Hospital	Yes	Yes		Waimea
Kina'Ole Estate	ARCH/RS	Yes	No		Kaneohe
Kohala Hospital	NF/Hospital	Yes	Yes		Kapaau
Kona Community Hospital	NF/Hospital	n/a	n/a		Kealahou
Kuakini Geriatric Care	NF/SNF	No	Yes		Honolulu
Kula Hospital	Hospital	Yes	Yes		Kula
Kulana Malama	NF/SNF	No	Yes		Ewa Beach
Lanai Community Hospital	NF/SNF	No	Yes		Lanai
Leahi Hospital	Hospital	Yes	Yes		Honolulu
Life Care Center of Hilo	NF/SNF	Yes	Yes		Hilo
Life Care Center of Kona	NF/SNF	Yes	Yes		Kona
Liliha Healthcare Center	NF/SNF	Case-by-case	Yes		Honolulu
Living Manoa	ALF/CCRC	Case-by-case	No	X	Honolulu
Maluhia	NF/SNF	Yes	Yes		Honolulu
Manoa Cottage Care Home	ARCH	Case-by-case	No	X	Honolulu
Manoa Cottage Kaimuki	SNF	Case-by-case	No	X	Honolulu
Nuuanu Hale	NF/SNF	No	Yes		Honolulu
Oahu Care Facility	NF/SNF	No	Yes		Honolulu
Palolo Chinese Home	NF/SNF	Yes	Yes		Honolulu
Pearl City Nursing Home	NF/SNF	No	Yes		Pearl City
Pu'uwai 'O Makaha	NF/SNF	No	Yes		Waianae

Facility Name	Type of Facility	Wandering	Medicaid	SCU	Location
Samuel Mahelona Memorial Hospital	NF/SNF	Yes	Yes		Kapaa
Queen's Medical Center – PCU	NF/SNF	Yes	Yes		Honolulu
The Plaza – Waikiki	ALF	Yes	No	X	Waikiki
The Plaza – Mililani	ALF	Yes	No	X	Mililani
The Plaza – Moanalua	ALF	Yes	No	X	Honolulu
The Plaza – Pearl City	ALF	Yes	No	X	Pearl City
The Plaza – Punchbowl	ALF	Yes	No	X	Honolulu
Wahiawa General Hospital	NF/SNF	Yes	Yes		Wahiawa
Yukio Okutsu State Veterans Home	NF/SNF	No	Yes		Hilo

Source: Information gathered from the Executive Office on Aging overlaid with information from the Alzheimer's Association.⁸¹

⁸¹ Executive Office on Aging. 2015. Skilled Nursing Facilities/Intermediate Care Facilities. Accessed March 19, 2015. <http://health.hawaii.gov/ohca/medicare-facilities/skilled-nursingintermediate-care-facilities/>.

Chapter 5: Existing Guidelines

Universal Design

Universal design, a term coined by architect named Ronald Mace, the founder and former program director of the Center of Universal Design at North Carolina State University, is widely used in the construction industry to describe a thing or space that is designed to be accessible to the widest possible range of people, including those of all ages and those with different physical and cognitive capabilities and disabilities.⁸² Universal design is based on seven principles that Mace, together with a group of architects, designers, and engineers, developed. The following list was taken from Universal Design, a website dedicated to the concept and its realization:⁸³

- **Equitable Use:** The design is useful and marketable to people with diverse abilities.
- **Flexibility in Use:** The design accommodates a wide range of individual preferences and abilities.
- **Simple and Intuitive Use:** Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
- **Perceptible Information:** The design communicates necessary information effectively to the user regardless of ambient conditions or the user's sensory abilities.
- **Tolerance for Error:** The design minimizes hazards and the adverse consequences of accidental or unintended actions.

⁸² Universal Design, n.d. "The Seven Principles of Universal Design." (Accessed April 18, 2015)
http://www.universaldesign.com/index.php?option=com_content&view=article&id=1761:the-seven-principles-of-universal-design&catid=2196:universal-design&Itemid=2931

⁸³ Ibid.

- **Low Physical Effort:** The design can be used efficiently and comfortably with minimum fatigue.
- **Size and Space for Approach and Use:** Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

Universal design benefits any environment because it can help improve users' overall quality of life. Specific universal design features can be found in both commercial and residential builds. Some examples of universal design in a nursing setting are:

- Electrical receptacles set higher than normal making them accessible to everyone
- Wider doorways
- Flat entryways and thresholds
- Hardware on doors and cabinets that allow easy access for people suffering from arthritis
- Storage spaces that are accessible to people of any height, including those in wheelchairs⁸⁴

Universal design also relates to the aging-in-place market. According the National Association of Home Builders (NAHB) there are certified Aging-in-Place Specialist (CAPS) contractors that can help families modify their homes so their loved ones do not have to move into a care facility. NAHB's research shows that remodeling an existing home is often cheaper than moving a person into a nursing facility. The NAHB website lists some common modifications for an aging-in-place remodel:⁸⁵

- ☐ **No-step entry.** No one needs to use stairs to get into a universal home or into the home's main rooms.

⁸⁴ The Center for an Accessible Society. n.d. "Universal Design." Accessed March 31, 2015. <http://www.accessiblesociety.org/topics/universaldesign/>.

⁸⁵ National Association of Home Builders. 2015. "What is Universal Design?" Accessed 31 March, 2015. <http://www.nahb.org/en/consumers/homeownership/homeownership-articles/what-is-universal-design.aspx>.

- **One-story living.** Places to eat, use the restroom and shower room, and sleep are all located on one level, which is barrier-free.
- **Wide doorways.** Doorways that are at 32-36 inches wide let wheelchairs pass through. They also make it easy to move big things in and out of the house.
- **Wide hallways.** Hallways should be 36-42 inches wide. That way, everyone and everything moves more easily from room to room.
- **Extra floor space.** Everyone feels less cramped. And people in wheelchairs have more space to turn.

Assisted Living Guidelines

Architect and gerontologist Victor Regnier has written many articles and books on assisted living and other challenges older adults experience on a daily basis. In his book, *Design for Assisted Living: Guidelines for Housing the Physically and Mentally Frail*, Regnier lays out 100 critical design considerations he believes should be incorporated into an assisted living space. Although all of the guidelines are important, seventeen are identified here as the most relevant to and beneficial for Dementia Care Facility design. Regnier's original numbering and critical design consideration titles are presented here for easier reference to the original text.

Critical Design Considerations

1. A site within a community's cognitive map

When selecting a site, it is important to choose an area with which many residents are familiar. Placing a facility near significant landmarks provides a point of reference for residents so that they can identify their location cognitively. From a marketing perspective, it is also important to place a facility near major roads or intersections. This will increase its visibility and presence in the neighborhood. Another aspect to consider when designing the facility is curb

appeal. Green grass, shrubs, trees, and other plant materials help ease people into a facility.⁸⁶

2. Reconciling typography with building configuration

Two factors to consider when designing a facility are its shape and topography. The transitions will provide challenges for many of the residents, but generally both ramps and stairs are necessary aspects of any facility. Ramps and stairs are also beneficial because they can help residents navigate throughout the site, moving from one elevation to another.⁸⁷ Designers, however, should not place ramps inside a building because residents who are not wheelchair bound can lose their balance, especially those with Alzheimer's disease and dementia, who may not notice the incline or decline of a ramp.

For residents who need a place to wander, flat, walkable, outdoor pathways are ideal and can help to relieve anxiety as well as provide a space for daily exercise.⁸⁸ Having plants, trees, and water features help the residents connect with nature.

3. Saving trees and other significant landscape features

If the site is planned for a lot with many existing trees, it is a good idea to save as many trees as possible. By saving existing trees, a facility can earn Leadership in Energy and Environmental Design (LEED) points.⁸⁹ More importantly, trees that are already on the site offer a quality that cannot be recreated by man.

⁸⁶ Regnier, Victor. 2002. *Design for Assisted Living: Guidelines for Housing the Physically and Mentally Frail*. New York: John Wiley & Sons Inc. 44.

⁸⁷ Ibid., 45.

⁸⁸ Ibid., 45

⁸⁹ U.S. Green Building Council. 2008. "Innovation in Design Credit Catalog." U.S. Green Building Council. March. Accessed April 2, 2015.
<http://www.usgbc.org/Docs/Archive/General/Docs3569.pdf>. 6.

6. Capturing views

According to Regnier, it is important to have both active and passive views in a building. Active views are views of the street, cityscape, and sidewalks; passive views are views of the gardens, lawns, trees, and nature.⁹⁰

Lanais and porches not only change the scale of the building as seen from the street, but also offer covered, more protected areas for residents to sit and enjoy different views, nature, and fresh air. They also provide a good source of natural air circulation in the building.⁹¹

11. Lighting at night

Proper lighting at night is very important in a Dementia Care Facility. Lighting can help residents find their way to the restroom and back to their rooms. Lighting is also an important security feature. Outdoor lighting can be used as an outdoor nighttime wayfinding feature that provides guidance to residents' family members and friends visiting the facility. The use of indirect lighting is also preferred as it has a more welcoming effect and can attract people at the street level.⁹²

12. Creating courtyards to capture views and ensure privacy

Creating courtyards in a Dementia Care Facility can bring nature into a site that may not offer much greenery outside its walls. Courtyards are designed to be peaceful, private, and to offer different sensory experiences of nature, such as the sensation of wind on one's body or the sounds of birds or insects chirping and wind blowing through trees. Another advantage to having a courtyard is the potential of reducing travel distance from one side of the facility to another.

⁹⁰ Ibid. 49

⁹¹ Regnier, Victor. 2002. Design for Assisted Living: Guidelines for Housing the Physically and Mentally Frail. New York: John Wiley & Sons Inc. 49.

⁹² Ibid., 52.

15. Gardens that provide continuity of lifestyle

Gardens are beneficial for dementia care facilities. Like courtyards, gardens provide an outlet for residents, a place to relieve anxiety as well as stimulate their muscles and minds. Providing a raised garden, roughly sixteen to twenty-four inches off the ground, allows residents to engage multiple senses at once, such as sight, smell, and sound. Gardens not only provide low-cost activity to the residents, but the act of gardening itself has been shown to be physically and emotionally beneficial and satisfying.⁹³

20. The healing therapeutic garden

Therapeutic gardens offer a healing environment for residents with different levels of cognitive disabilities. Gardening can provide both a daily activity as well as a non-pharmaceutical method of therapy for residents. Other beneficial features of a garden include a homelike feel and privacy for the gardener, a way to stimulate mental alertness, a place for social exchange and gathering, and a secure outdoor space for activities and seating.⁹⁴

25. A looped walking pathway

A looped walking path between the garden and the building promotes exercise for the residents. Focal points at different locations along the path, such as a fountain, alcove seating, or a trellis, also encourage residents to continue walking. Pathway materials should not hinder anyone's ability to use the pathway. It is best to choose materials that provide support and grip for older adults with walkers, canes, and wheelchairs, such as cast-in-place concrete. Loose impediments such as gravel or cobble stone would not be suitable.

⁹³ Regnier, Victor. 2002. *Design for Assisted Living: Guidelines for Housing the Physically and Mentally Frail*. New York: John Wiley & Sons Inc. 56.

⁹⁴ *Ibid.*, 61.

31. Making big spaces smaller and small spaces bigger

As mentioned earlier, as a person's Alzheimer's disease progresses, he or she loses the ability to visually tell apart spaces; the world becomes two-dimensional. Architects use different measures to help residents feel more at home and differentiate between spaces and rooms more easily. Some of these include half walls, contrasting colors, and differing ceiling heights.⁹⁵

35. Personalization at the unit edge

Regnier recommends allowing each resident to personalize his or her own door. This not only helps to strengthen the homelike feel of the room, but is also a useful wayfinding feature. Personal items or pictures can help a resident who is or feels lost recognize his or her room.⁹⁶

58. Technology that supports as well as extends independence and privacy

Various support technologies in a Dementia Care Facility are beneficial for both the residents and the staff. With certain new technology, staff members can provide voice-to-voice communications to all the residents in the case of an emergency.⁹⁷ The Plaza at Moanalua equips each resident's room with an intercom system that has both a pull string for emergencies and a hard-lined smoke detector. This type of system makes it easier for staff to immediately locate a fire, if one was to occur.

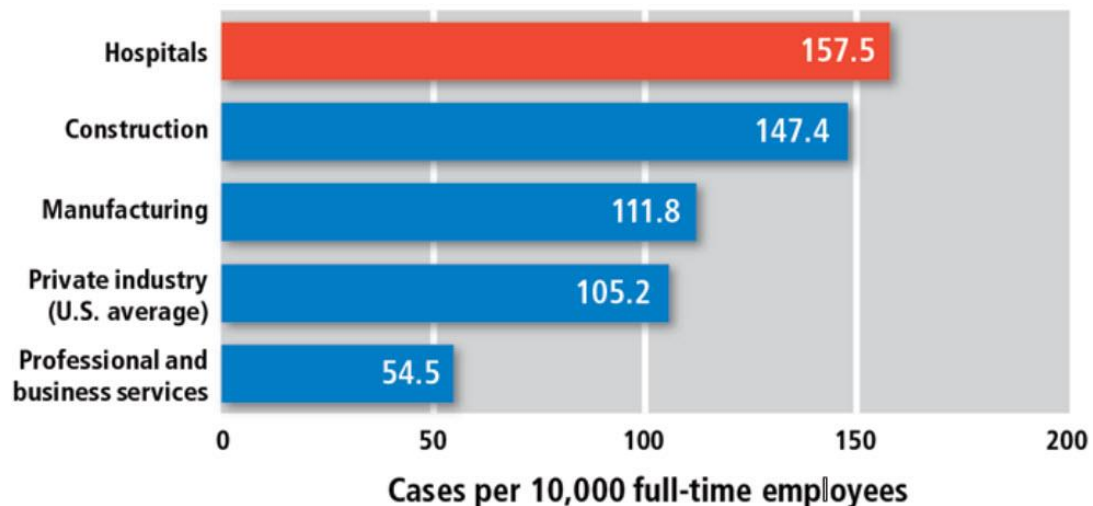
Managing residents in a Dementia Care Facility can be a difficult task. Understandably, residents wander about the facility and its environs, socializing with others, searching for a restroom, exercising, or simply being lost. It is often difficult to track and monitor every resident. Security bracelets allow residents to wander around on a secure floor without much supervision. These bracelets prevent them from entering elevators, secured stairways, or restricted areas.

⁹⁵ Ibid., 70.

⁹⁶ Ibid. 75

⁹⁷ Ibid. 99

Another useful technology is a lifting device that can assist the Certified Nursing Assistant (CNA). Overexertion injuries are the number one cause of workman's compensation in the nursing field.⁹⁸



Data source: Bureau of Labor Statistics

Figure 5: Chart showing 2011 numbers of injuries by career industry. Data from the Bureau of Labor compiled in 2011 from 58,860 work related incidents.

69. Pets, plants, and children

By welcoming pets, plants, and children, a Dementia Care Facility can bring life and joy into many people's lives. Interaction with pets, plants, and children is a great non-drug therapy that can help relieve anxiety and agitation. Pets such as cats and dogs can provide unconditional affection for residents. Other animals such as rabbits, birds, parakeets, and mice are also wonderful to interact with. It is important to note that if a facility decides to get a communal pet, the animal will need a place to sleep, drink water, eat, and relieve itself.⁹⁹

⁹⁸ Occupational Safety and Health Administration. 2013. "Worker Safety in Hospitals." Know The Facts. September. Accessed April 3, 2015.

https://www.osha.gov/dsg/hospitals/documents/1.1_Data_highlights_508.pdf. 2.

⁹⁹ Regnier, Victor. 2002. Design for Assisted Living: Guidelines for Housing the Physically and Mentally Frail. New York: John Wiley & Sons Inc. 114.

76. A safe bathroom

The bathroom, in this manuscript referred to separately as restroom and shower room, is the number one place older adults are injured.¹⁰⁰ Injuries late in life can have devastating effects and can greatly reduce a person's mobility. When designing a restroom or shower room it is best to create them to be adaptable to change. Not all residents will have the same physical challenges, so planning ahead can reduce the amount of modifications needed in the future.¹⁰¹

Following is a list of features and guidelines for building ideal restrooms and shower rooms in a Dementia Care Facility:

Accessible design

- ☐ Minimum of 36" wide doors
- ☐ Space for wheelchairs
- ☐ Lower countertops
- ☐ Knee space
- ☐ Grab bars
- ☐ Rocker switch for lights
- ☐ Shower chair

Toilet design

- 17"-18" height for the toilet
- A bidet
- Appropriate grab bars

Lavatory design

- Easy to access
- Space for wheelchair
- Lever faucets
- Faucets located closer to front of lavatory
- GFCI outlets

Shower design

¹⁰⁰ Ibid. 122.

¹⁰¹ Ibid. 122

- ☐ A minimum of 36"x48"
- ☐ Grab bars in specific locations
- ☐ Regulated water temperature that is not able to exceed 110 degrees Fahrenheit
- ☐ Curb-less shower
- ☐ Built-in, collapsible shower chair
- ☐ Adjustable shower heads
- ☐ Multiple shower heads
- ☐ Slip resistant flooring material

It is important to note that shower size requirements differ from state to state. Also, when designing restrooms and shower rooms for a Dementia Care Facility, the designer must follow all of the Department of Justice 2010 ADA Standards.

90. Social wandering

A common behavior of many older adults is wandering from one place to another. Although there may not be a particular reason for this behavior, facility providers must accommodate for it. Incorporating a looped path into the design of the facility allows residents to wander in a secure environment. Wandering paths can also be connected to other program features such as the kitchen, dining room, living room, and nurse's station.

92. Disguising the exit, elopement, and exit control

Just like wandering, elopement is a behavior that dementia care facilities must plan for. Many new residents that are moved into dementia care facilities initially believe they are going on vacation or only staying temporarily.¹⁰² Depending on the type of facility and local fire codes, many fire exits must remain unlocked. Some facilities have security features attached to the doors. In California and other states, a thirteen-second delay egress system is standard.¹⁰³

¹⁰² Ibid., 140.

¹⁰³ Ibid., 140.

This type of system can be effective depending on a person's cognitive ability; he or she may still have the ability to open the door after the thirteen-second delay.

Another tactic two of the case study facilities implemented was camouflage; the exit doors and the doors to the elevator were disguised to match the corridor walls. It also helps to place the exit somewhere other than directly at the end of a hallway, an obvious exit point. Placing the exit door along the corridor wall allows it to blend into the environment.

95. Life skills activities

Life skills activities, also called activities of daily living (ADL), are very important in the lives of Dementia Care Facility residents. ADLs provide residents with both the physical and mental stimulation they need to live longer and healthier lives. ADLs are not limited to basic activities like eating, bathing, dressing, toileting, and walking, but also include events such as laundry, cooking, arts and crafts, and various physical activities.

Summary of Regnier's Design Considerations

According to Regnier, there are three different approaches to designing a facility for people with dementia.¹⁰⁴ These are:

- A separate unit or building dedicated to dementia care
- The physical and mental integration of residents into the rest of a care facility
- A continuum or "home" model

Regnier notes that in order to help reduce anxiety or conflict between the residents, it is best to create small clusters of living spaces. He recommends the ideal number of residents clustered together to be six to eight, with twenty-four to forty-eight people per floor.¹⁰⁵ Unfortunately, facilities cannot always facilitate these numbers and, therefore, a second-best recommendation is twelve to fifteen in a cluster, with forty-eight to sixty people per floor. With such a high number of

¹⁰⁴ Ibid. 146

¹⁰⁵ Ibid.

residents on each floor, it is the administrators' duty to ensure that each of the residents receives equal and quality care.

Visitability

Visitability means changing existing construction methods to accommodate those with physical disabilities in all settings. Eleanor Smith, who has been physically disabled since she was three years old, came up with the concept and writes this of the moment the idea came to her:

One day in 1986 I was driving around in Atlanta, Georgia, my home city, and I passed through a large development of new houses. As usual, there were steps at every entrance. But this time I saw the houses differently: "These homes could have all had access!"¹⁰⁶

Smith became the founder of an organization called Concrete Change, a group of both physically able and disabled women who work to change legislation regarding construction standards in Georgia and beyond.

About the same time, the universal design movement began to receive attention from the physically disabled communities; however, the two groups did not work together until much later. In 1990, Concrete Change collaborated with Habitat for Humanity Atlanta and together they built twenty homes with a zero-step entrance.

In 1991, Concrete Change presented a local councilperson with an ordinance that to revise building codes for certain private single-family homes in Atlanta, requiring basic access. The following year, the Council passed the new ordinance making this the first visitability law passed in the United States.¹⁰⁷

Design features for visitability include:

- At least one zero-step entrance to the house with 1:12 pathway from either the driveway or the street.

¹⁰⁶ Smith, Eleanor. 2003. "Concrete Change." The Beginnings of Concrete Change. Accessed April 8, 2015. <http://concretechange.org/visitability/early-history/>

¹⁰⁷ Ibid.

- Door widths wide enough to accommodate a variety of wheelchairs.
- At least one accessible shower room or half shower room on the first floor.

California's RCFE (Residential Care Facilities for the Elderly)

California's guidelines for ensuring quality care within care facilities, officially called Residential Care Facilities for the Elderly (RCFE), closely follow the recommendations of many gerontologists¹⁰⁸. When inspecting an RCFE environment licensed as a Dementia Care Facility, the California Department of Social Services (CDSS) looks at the following features and services:

- Acoustics
- Natural lighting
- Adequate lighting, elimination of glare
- Color patterns and textures on the walls
- Wayfinding
- Outdoor access
- Staff access to residents' room
- Wandering alert system
- Exit delay
- Secured access for outside area

The CDSS also ensures that each Dementia Care Facility's services meet the needs of residents at every stage of dementia.

The state of California Community Care Licensing Division (CCL) has an in-depth manual, *California-DSS-Manual-CCL*, which covers not only Dementia Care Facilities, but all types of facilities that care for aging adults. In the

¹⁰⁸ California Advocates for Nursing Home Reform. 2015. RCFEs: Dementia Care Checklist. March 27. Accessed February 14, 2016.
http://www.canhr.org/factsheets/rcfe_fs/html/rcfe_dementia_fs.htm.

Dementia Care section, the manual ensures that each facility is built according to the same requirements laid out above.

Chapter 6: Case Studies

Objective

The four case studies selected are Manoa Cottage in Kaimuki, the Plaza at Moanalua, the Plaza at Mililani, and Hi'olani Care Center, all located on the island of Oahu. These were chosen because each specializes in care for older adults with Alzheimer's disease and dementia.

Dementia care can exist not only in an SNF, but also in other types of facilities. These four case studies represent a spectrum: Manoa Cottage in Kaimuki is an SNF, the Plazas are ALFs and Memory Care facilities, and Kahala Nui is a CCRC.

The case studies were analyzed and categorized based on several different criteria including history of facility, demographics of surrounding area, building form, and cost. They also showcase four different approaches to care. The four selected facilities will only reflect a small portion of the different facilities listed in chapter 4. The case studies can give families an idea of the spectrum of cost for facilities that can accommodate older adults with Alzheimer's disease and dementia.

At the end of the case studies section, the author identifies and discusses the features that are of greater importance for a facility that specializes in dementia care. These features, including site, general area, safety/security, corridors, and activities, are laid out in a table which compares them in each of the four facilities.

Case Study 1: Manoa Cottage in Kaimuki (SNF)



Figure 6: Exterior view of Manoa Cottage in Kaimuki¹⁰⁹

Project Location Kaimuki, Oahu

Architect Dennis Glynn Architects, Inc.

¹⁰⁹ Manoa Cottage in Kaimuki. 2012. Accessed April 10, 2-15.
<http://manocottage.com/skilled-nursing-facility/>.

Table 4: Building and Resident Information for Manoa Cottage in Kaimuki.

Building Information		Resident Information	
Number of Units	27	Age Range	67-97
Number of Floors	2	Average Age	86
Facility Type	Long-Term Care	Number of Residents	24
	Hospice Care	Number of Men	4
	Respite Care	Number of Women	24
Room Types	Private	Number of Couples	1
	2-Bed Room		
	3-Bed Room		
Completion Date	2012		

Project History

Manoa Cottage in Kaimuki, owned by Sandra Shim and her daughter Elizabeth Shim, first opened to the public on June 5, 2012. The facility, a Skilled Nursing Facility, offers long-term care, hospice care, and respite care, and can accommodate older adults with advanced dementia. The philosophy behind the design of this facility, which was retrofitted from an old apartment building, is to provide a space that feels like home.



Figure 7: Manoa Cottage in Kaimuki is located on Oahu.¹¹⁰

¹¹⁰ Image from Google Earth

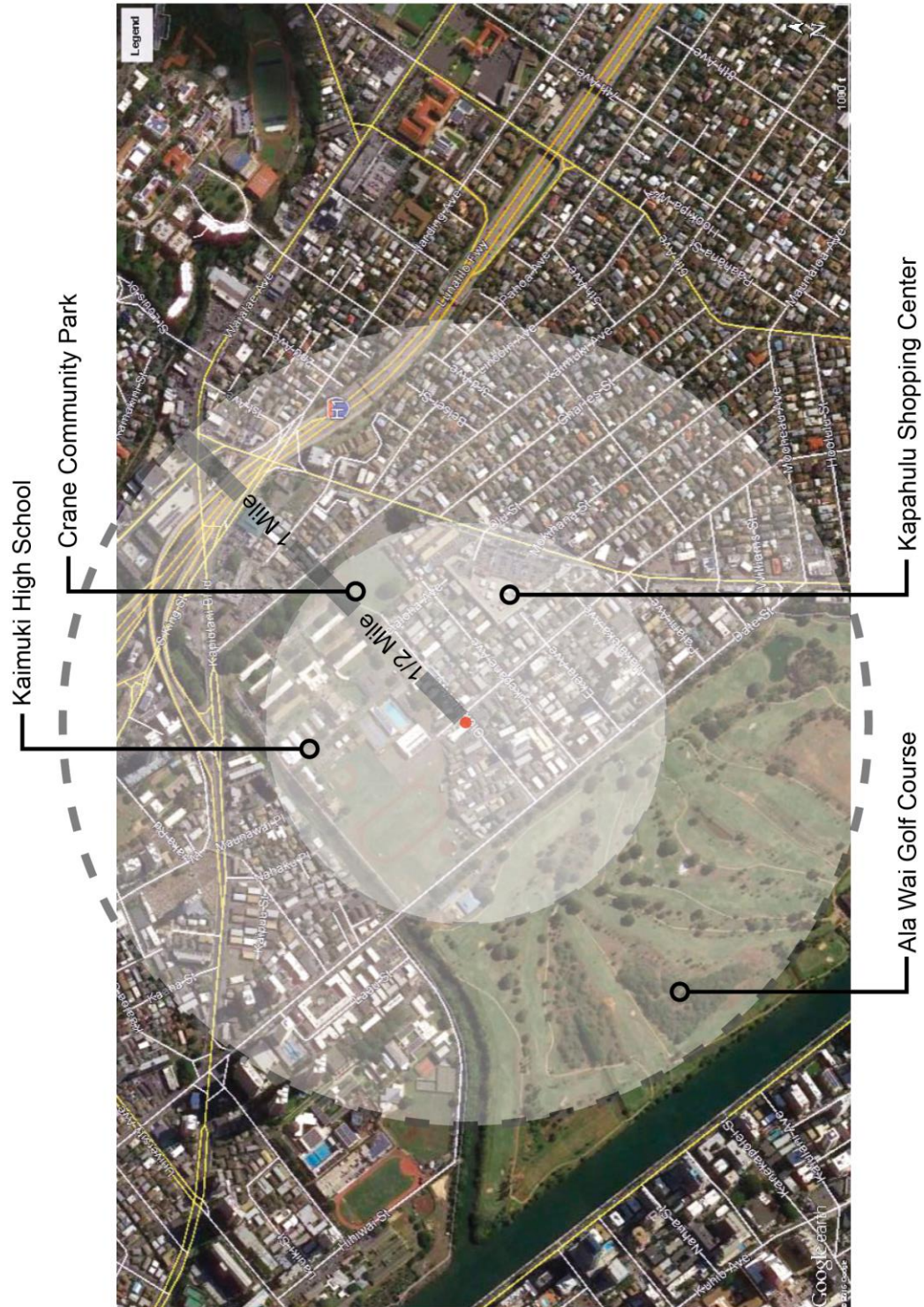


Figure 8: Manoa Cottage in Kaimuki is located on Oahu.¹¹¹

¹¹¹ Image from Google Earth

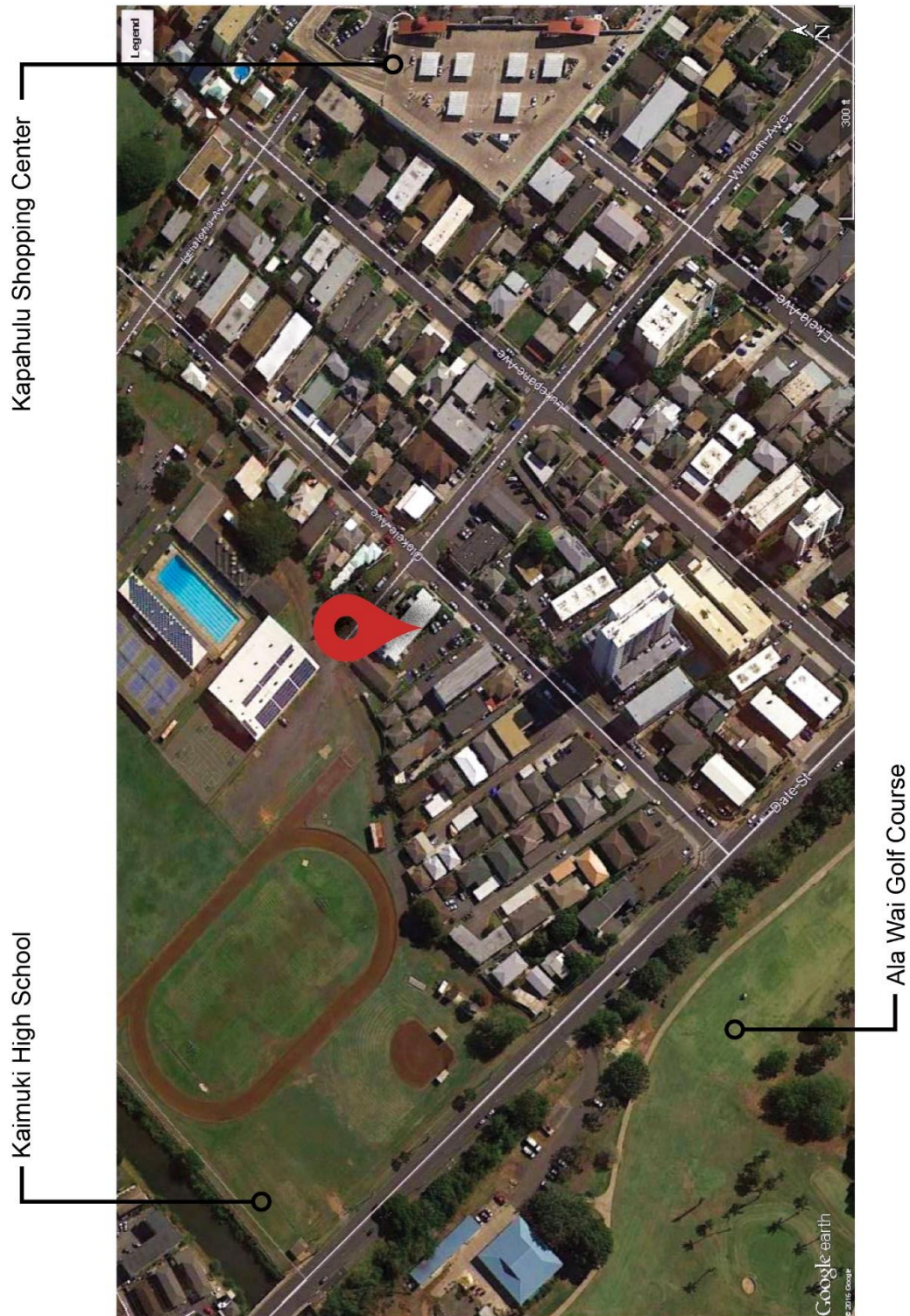


Figure 9: Manoa Cottage in Kaimuki is located on Oahu.¹¹²

¹¹² Image from Google Earth

Demographics of the Surrounding Area

Manoa Cottage is located in the Diamond Head, Kapahulu, and St. Louis district. The current population of the district is 20,366 with a median age of 34.¹¹³ The district's median household income is \$53,273 and the average household net worth is \$658,759.¹¹⁴ Thirty-four percent of the district's population is comprised of long-term residents who have lived in their homes for more than five years, while thirteen percent have moved there within the last year.¹¹⁵ A majority of people who live in this area are college graduates who are married.¹¹⁶

This case study is located on the corner of Olokele Avenue. Some of the schools that are nearby are Ala Wai Elementary and Kaimuki High school. The nearest park is Crane Community Park. The Ala Wai golf course is also nearby. The neighborhood's surrounding context is a combination of low-rise apartments and single-family homes. There are hardly any trees in the neighborhood making this area hot and uncomfortable to walk around.

¹¹³ Realtor.com. 2015. Diamond Head, Kapahulu, St. Louis, Urban Honolulu, HI. Accessed April 12, 2015. <http://www.realtor.com/local/Diamond-Head-Kapahulu-St-Louis-Urban-Honolulu-HI/lifestyle>.

¹¹⁴ Ibid.

¹¹⁵ Ibid.

¹¹⁶ Ibid.

Environmental Information

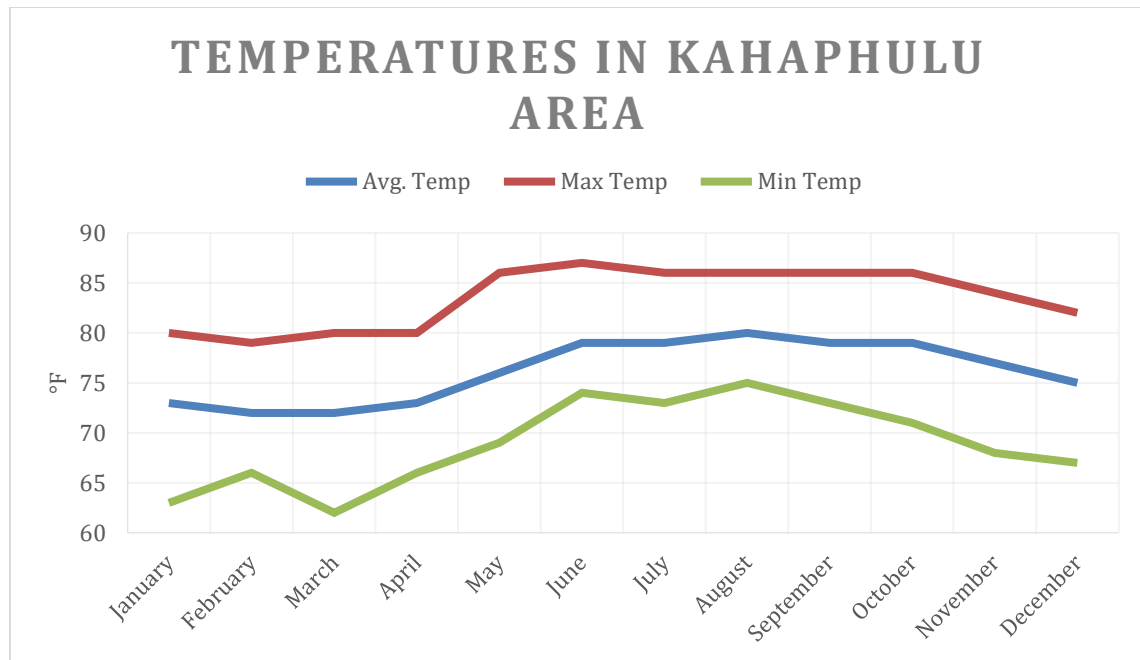


Figure 10: Graph of the temperature in the Kapahulu area.

Source: Data collected from areavibes. Graph made by Author.

Air Quality

Table 5: Air Quality in Kapahulu. Area Data of air quality in the Kapahulu area.¹¹⁷

Measurement	Days
Days measured	365
Days with good air quality	347
Days with moderate air quality	18

Source: areavibes. 2015. *Diamond Head-Kapahulu Air Quality Information*. Accessed April 15, 2015. <http://www.areavibes.com/honolulu-hi/diamond+head-kapahulu/weather/>.

¹¹⁷ Ibid.

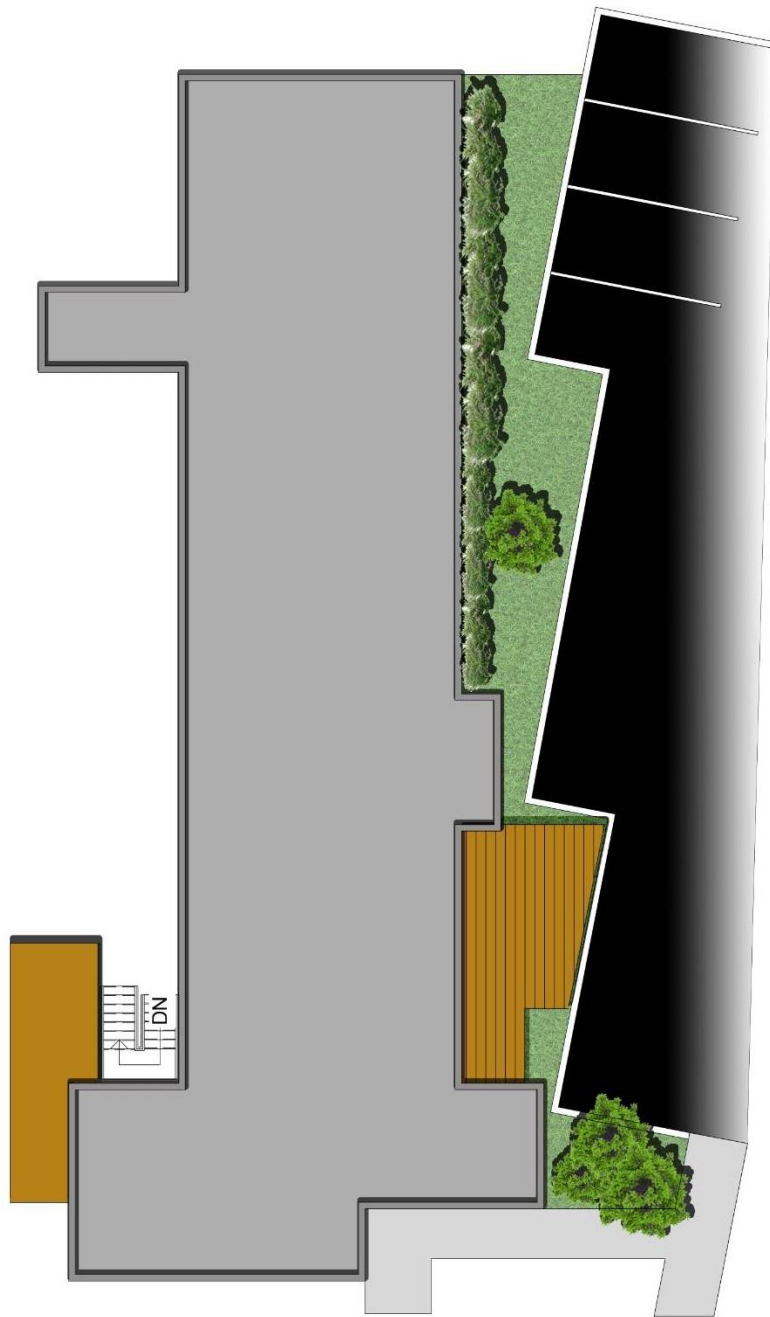


Figure 11: Manoa Cottage in Kaimuki Site Plan. Drawing edited by author.¹¹⁸

¹¹⁸ Drawing Courtesy of Dennis Glynn Architects..

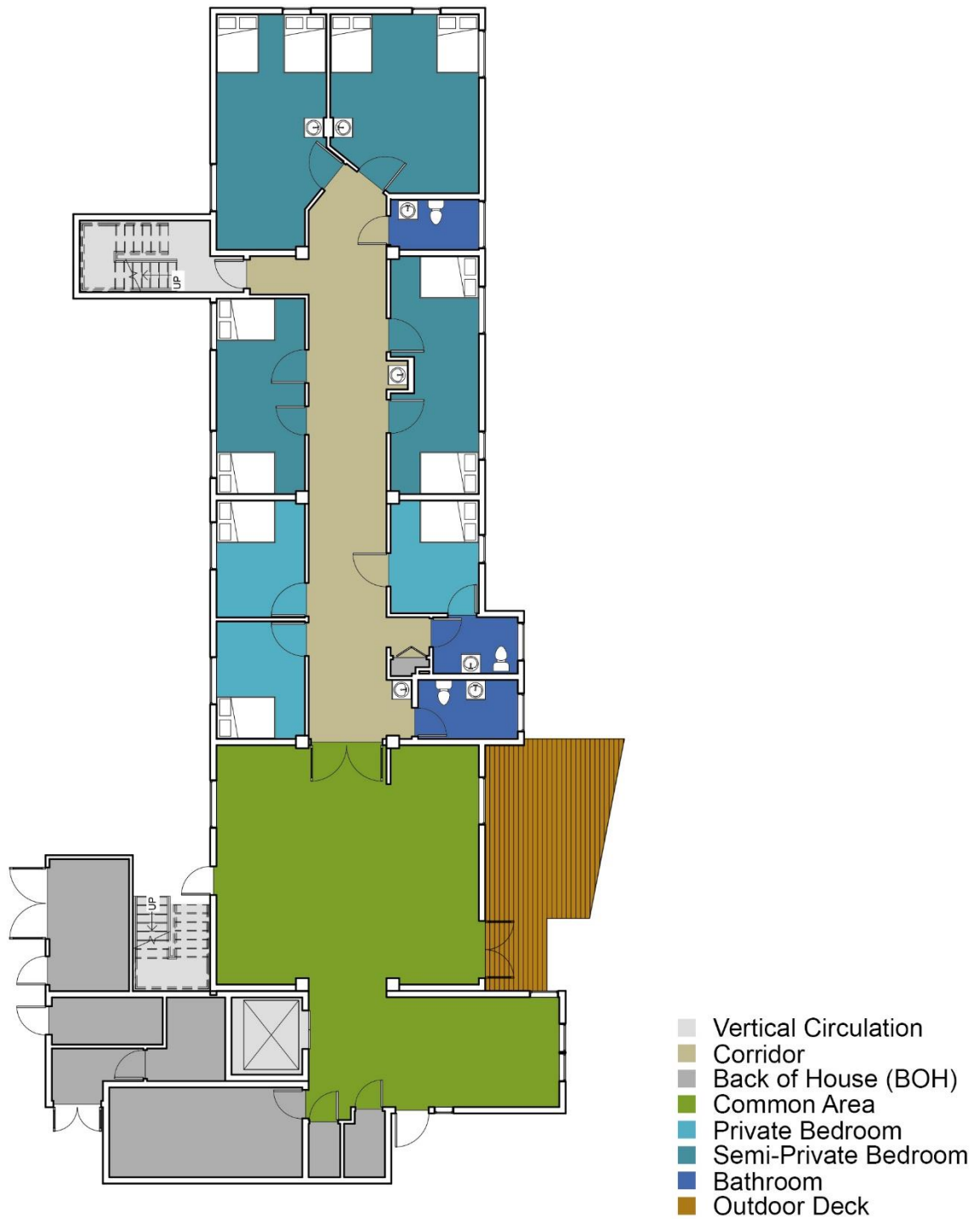


Figure 12: Manoa Cottage in Kaimuki First Floor Plan. Drawing edited by author.¹¹⁹

¹¹⁹ Ibid.

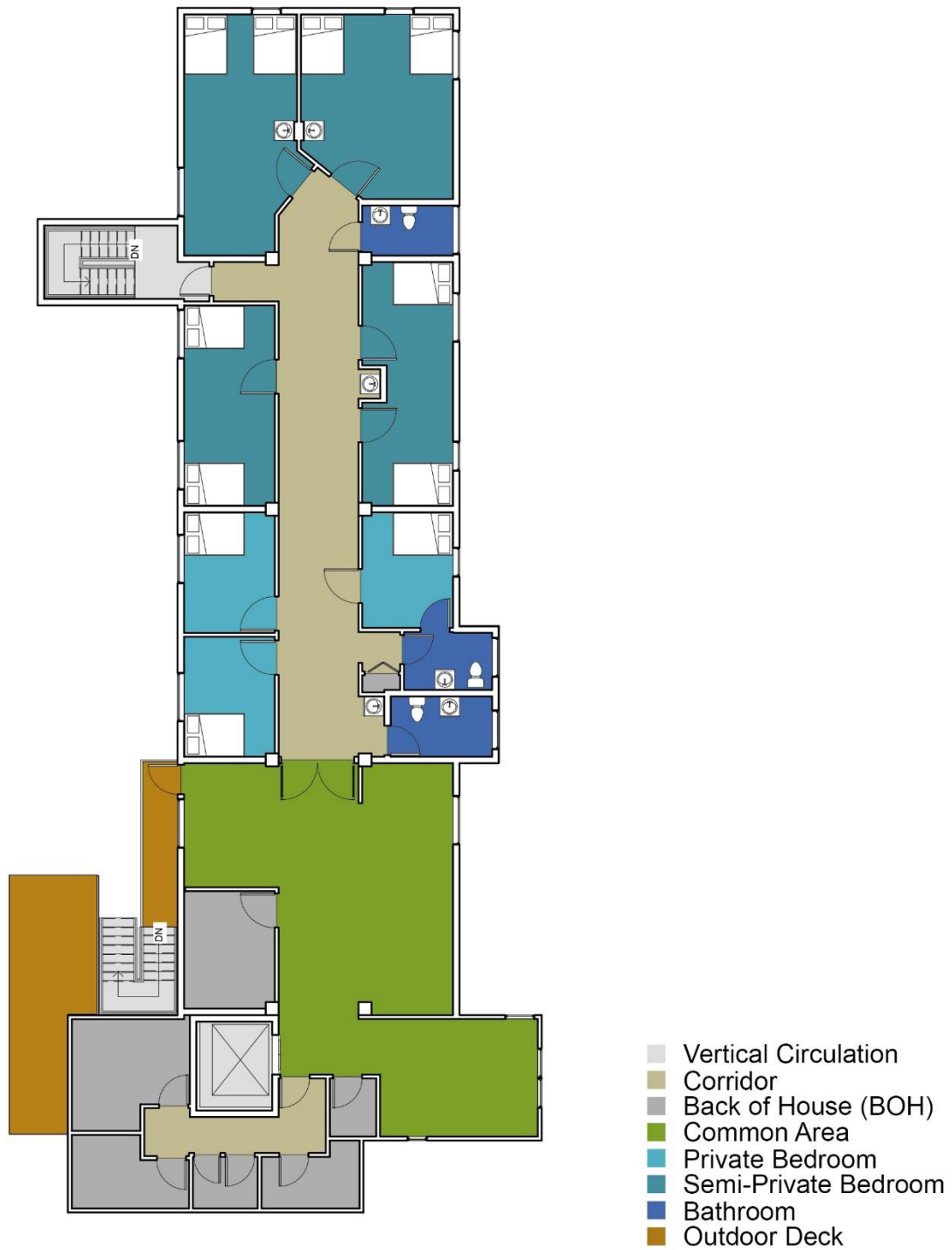


Figure 13: Manoa Cottage in Kaimuki Second Floor Plan. Drawing edited by author.¹²⁰

¹²⁰ Ibid.

Cost and Activities Information

Cost

Table 6: Cost of Rooms and Additional Costs of Manoa Cottage in Kaimuki.

Room Type	Daily Cost	Federal Assistance
Private	\$345	\$0
Semi-Private	\$315	\$0
Three bedroom	\$345	\$0
Additional Costs		
Oxygen Concentrator	\$70	\$0
Standard Wheelchair	\$20	\$0
Feeding Pump	\$20	\$0
Bedside Commode	\$5	\$0
Walker	\$10	\$0
Oral Suction	\$30	\$0
Labeling of Personal Items	\$20 – one-time fee	\$0
Telephone Service	\$45	\$0

Note. Additional costs provided by Administrator Calvin Hara¹²¹

¹²¹ Calvin Hara, email message to author, April 13, 2015.

Activities

Below is an example of activities the residents at Manoa Cottage in Kaimuki experience on a monthly basis.

Activities Calendar

Manoa Cottage Kaimuki



April 2015

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
5 EASTER 10:00am Morning Stretch 10:15am Parachute 10:45am Sing-a-long 1:00pm Outdoor Stroll 2:00pm Easter Celebration 4:00pm Current Events After Dinner... Theatre: Residents' Choice	6 10:00am Zumba Class 11:15am Current Events 1:00pm Outdoor Stroll 2:00pm Tric-tac-toe Toss 4:00pm Trivia After Dinner... Crosswords	7 10:00am Morning Stretch 10:15am Cardio Exercise 10:45am Current Events 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Balloon Volleyball After Dinner... Ice Cream Social	8 10:00am Sounding Joy, on the 2 nd Floor 10:00am Morning Stretch 10:15am Cardio Exercise 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Arts & Crafts 4:00pm Current Events After Dinner... Bingo	9 10:00am Morning Stretch 10:15am Cardio Exercise 10:45am Trivia 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Hula with Malia After Dinner... Connect the Dots	10 GOOD FRIDAY 10:00am Morning Stretch 10:15am Cardio Exercise 11:00am Trivia 1:00pm Outdoor Stroll 2:00pm Trivia 3:15- 3:45pm Entertainment - "The Movement Center" 4:00pm Table Games After Dinner... Clay Molding	11 10:00am Morning Stretch 10:15am Cardio Exercise 10:45am Current Events 1:00pm Outdoor Stroll 2:00pm Arts & Crafts After Dinner... Brain Teasers
12 10:00am Morning Stretch 10:15am Parachute 10:45am Sing-a-long 1:00pm Outdoor Stroll 2:00pm Bowling 4:00pm Current Events After Dinner... Theatre: Charlie Chaplain	13 10:00am Morning Stretch 10:15am Balloon Volleyball 11:15am Current Events 1:00pm Outdoor Stroll 2:00pm Tric-tac-toe Toss 4:00pm Trivia After Dinner... Crosswords	14 10:00am Morning Stretch 10:15am Cardio Exercise 10:45am Current Events 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Weir Science After Dinner... Ice Cream Social	15 10:00am Sounding Joy, on the 2 nd Floor 10:00am Morning Stretch 10:15am Cardio Exercise 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Arts & Crafts 4:00pm Current Events After Dinner... Bingo	16 8:45am Church Service, Non-denominational 11:00am Buddhist Religious Service 11:30am Trivia with Chaplain 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Table Games 3:30pm Bingo After Dinner... Connect the Dots	17 10:00am Morning Stretch 10:15am Cardio Exercise 11:00am Trivia 1:00pm Outdoor Stroll 2:00pm Baking Class After Dinner... Clay Molding	18 10:00am Morning Stretch 10:15am Cardio Exercise 10:45am Current Events 1:00pm Outdoor Stroll 2:00pm Arts & Crafts After Dinner... Brain Teasers
19 10:00am Morning Stretch 10:15am Parachute 10:45am Sing-a-long 1:00pm Outdoor Stroll 2:00pm Bowling 4:00pm Current Events After Dinner... Theatre: Residents' Choice	20 10:00am Morning Stretch 10:15am Balloon Volleyball 11:15am Current Events 1:00pm Outdoor Stroll 2:00pm Tric-tac-toe Toss 4:00pm Trivia After Dinner... Crosswords	21 10:00am Morning Stretch 10:15am Cardio Exercise 10:45am Current Events 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Golf After Dinner... Ice Cream Social	22 EASTER DAY 10:00am Sounding Joy, on the 2 nd Floor 10:00am Morning Stretch 10:15am Cardio Exercise 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Arts & Crafts 4:00pm Current Events After Dinner... Bingo	23 10:00am Morning Stretch 10:15am Cardio Exercise 10:45am Trivia 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Table Games After Dinner... Connect the Dots	24 10:00am Morning Stretch 10:15am Cardio Exercise 11:00am Trivia 1:00pm Outdoor Stroll 2:00pm Bingo After Dinner... Clay Molding	25 10:00am Morning Stretch 10:15am Cardio Exercise 10:45am Current Events 1:00pm Outdoor Stroll 2:00pm Arts & Crafts After Dinner... Brain Teasers
26 10:00am Morning Stretch 10:15am Parachute 10:45am Sing-a-long 1:00pm Outdoor Stroll 2:00pm Bowling 4:00pm Current Events After Dinner... Theatre: Charlie Chaplain	27 10:00am Morning Stretch 10:15am Balloon Volleyball 11:15am Current Events 1:00pm Outdoor Stroll 2:00pm Tric-tac-toe Toss 4:00pm Trivia After Dinner... Crosswords	28 8:45am Church Service, Non-denominational 11:00am Buddhist Religious Service 11:30am Trivia with Chaplain 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Weir Science After Dinner... Ice Cream Social	29 10:00am Sounding Joy, on the 2 nd Floor 10:00am Morning Stretch 10:15am Cardio Exercise 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm Arts & Crafts 4:00pm Current Events After Dinner... Bingo	30 10:00am Morning Stretch 10:15am Cardio Exercise 10:45am Trivia 1:00pm Outdoor Stroll 2:00pm Trivia 2:30pm "Walk 'Ehu" After Dinner... Connect the Dots	31 10:00am Morning Stretch 10:15am Cardio Exercise 11:00am Trivia 1:00pm Outdoor Stroll 2:00pm Bingo After Dinner... Clay Molding	

Figure 14: Activities calendar example provided by Administrator Calvin Hara.¹²²

¹²² Ibid.

Case Study 2: The Plaza at Moanalua (ALF, Memory Care)



Figure 15: Exterior view of The Plaza at Moanalua¹²³

Project Location	Moanalua, Oahu
Architect	Wattenburger Architects

¹²³ The Plaza Assisted Living. 2015. The Plaza Assisted Living. Accessed Decembe 22, 2015. <https://www.facebook.com/ThePlazaAssistedLiving/photos/pb.121696281237347.-2207520000.1450825967./1020108981396068/?type=3&theater>

Table 7: Building and Resident Information for the Plaza at Moanalua.

Building Information		Resident Information	
Number of Units	155	Age Range	72-103
Number of Floors	6	Average Age	85
Facility Type	Independent Living	Number of Residents	128
	Assisted Living	Number of Men	44
	Memory Care	Number of Women	84
	Respite Care	Number of Couples	10
Room Types	2 Bedroom Suites		
	1-Bed Studios		
Completion Date	2012		

Project History

The Plaza Assisted Living was founded by a local businessman looking for a place for his aging parents to live. He, like many adult children, could not find a place he was completely satisfied with, where he believed his parents could live comfortably. Instead, he decided to build this facility. The Plaza at Moanalua is one of five locations of the Plaza Assisted Living. The other locations are Punchbowl, Mililani, Pearl City, and Waikiki, which is currently under construction.



Figure 16: The Plaza at Moanalua is located on Oahu.¹²⁴

¹²⁴ Image from Google Earth

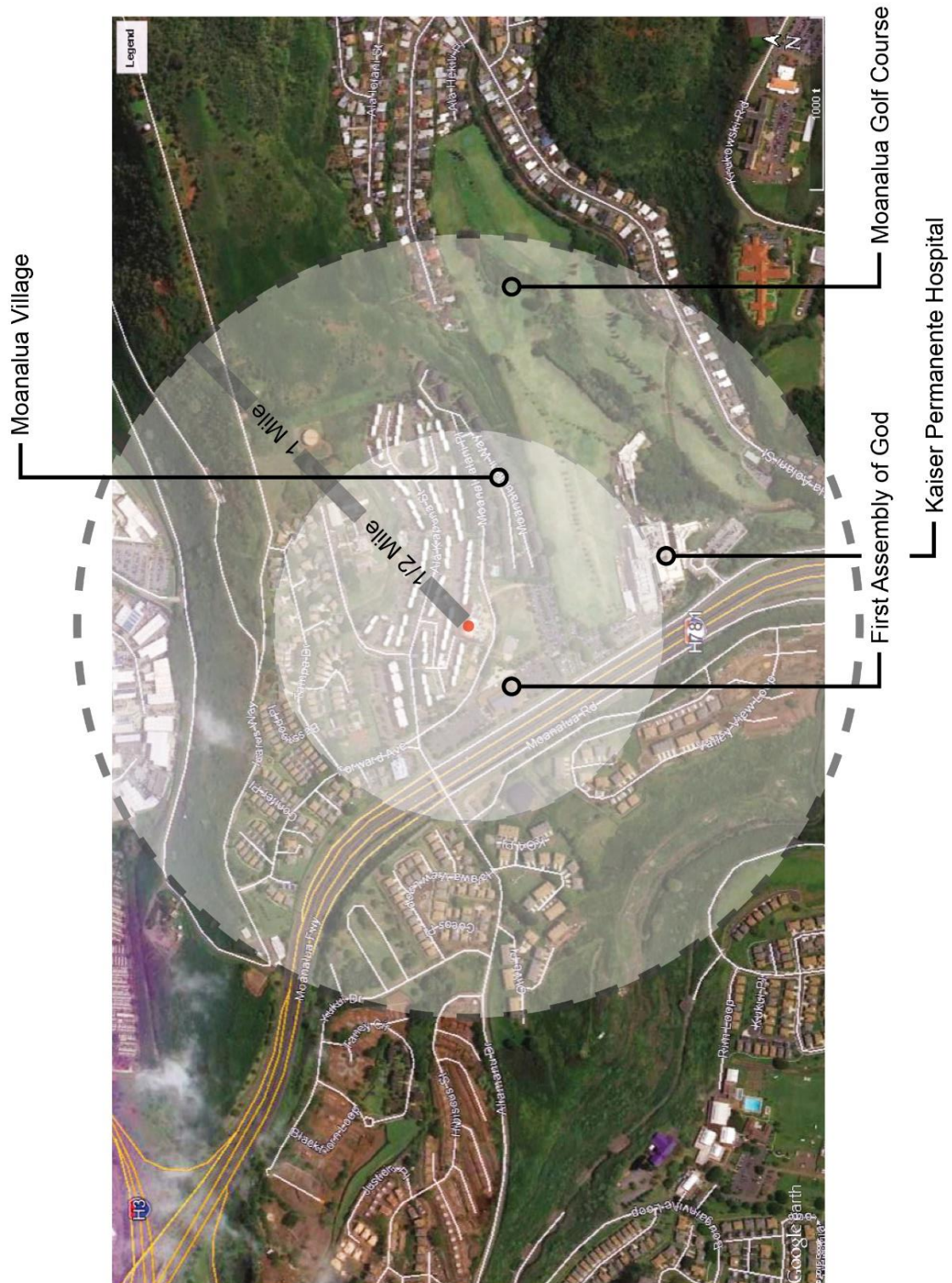


Figure 17: The Plaza at Moanalua is located on Oahu.¹²⁵

¹²⁵ Image from Google Earth

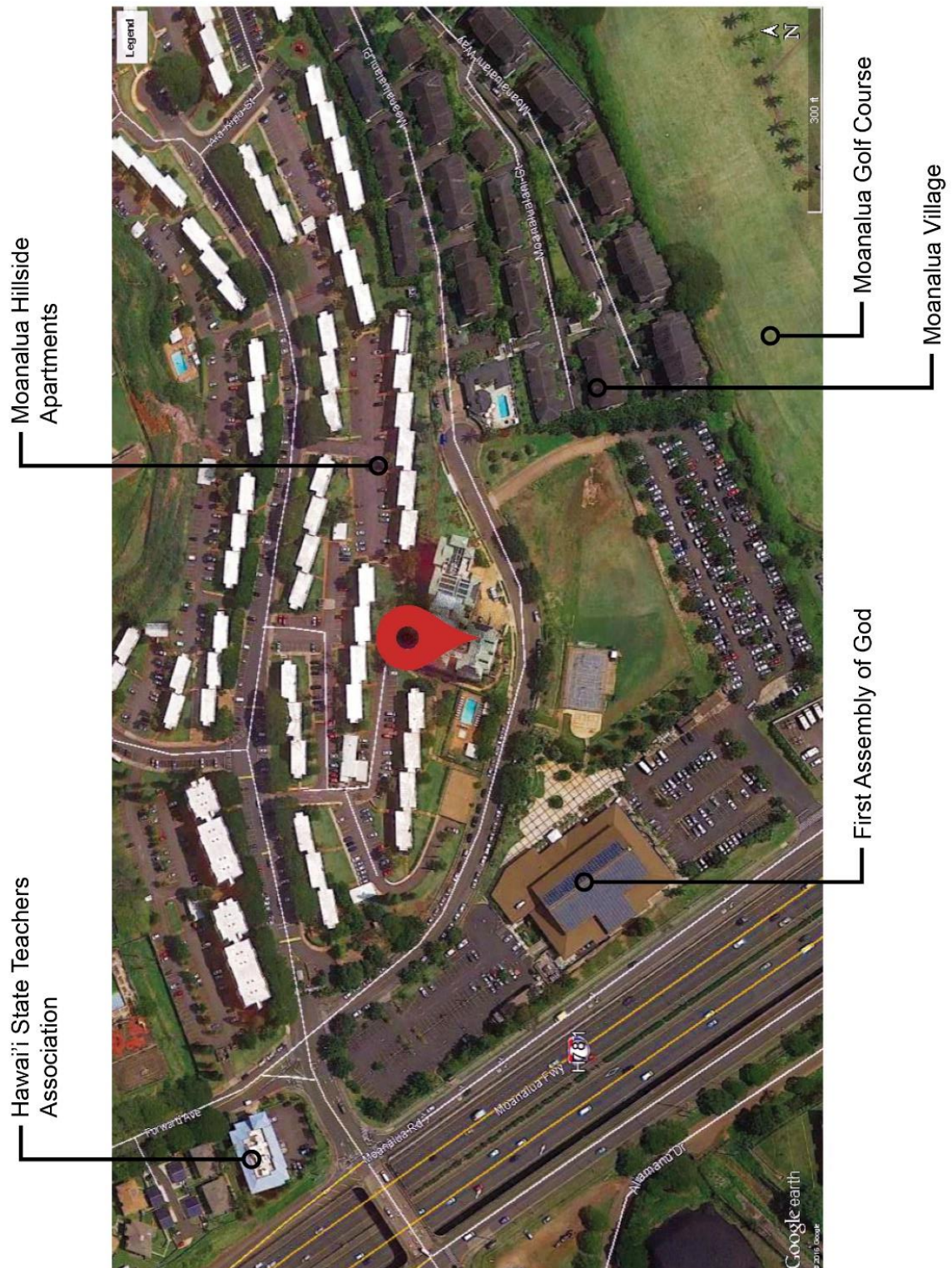


Figure 18: The Plaza at Moanalua is located on Oahu.¹²⁶

¹²⁶ Image from Google Earth

Demographics of the Surrounding Area

The Plaza at Moanalua is located in the Moanalua district. The district's population as of 2013 was 9,918 with a median age of 44. Moanalua's median household income is \$102,485, and the average household net worth is \$1,176,540. Forty-one percent of Moanalua's population is made up of long-term residents who have lived in their homes for more than 5 years, while seventeen percent has moved there in the last year.¹²⁷

Almost 20 percent of Moanalua residents are college graduates, and 44 percent are married. Many residents are property owners, and almost 41 percent are between the ages of 20 and 49. Top career fields represented in Moanalua are the healthcare industry, education, and business office administration.¹²⁸

This case study is located on the corner of Moanalualani Place. Some of the schools nearby are Red Hill Elementary School and Christian Academy School. Recreational parks nearby are the Moanalua Golf Course and the Honolulu Country Club. The neighborhood is comprised of a combination of low-rise apartments and a gated community. Kaiser Permanente Hospital is down the road from the Plaza.

¹²⁷ Realtor.com. 2014. Moanalua, Urban Honolulu, HI. Accessed April 21, 2015. http://www.realtor.com/local/Moanalua_Urban-Honolulu_HI/lifestyle.

¹²⁸ Realtor.com. 2014. Market Overview & Information. Accessed April 21, 2015. http://www.realtor.com/local/Moanalua_Urban-Honolulu_HI

Environmental Information

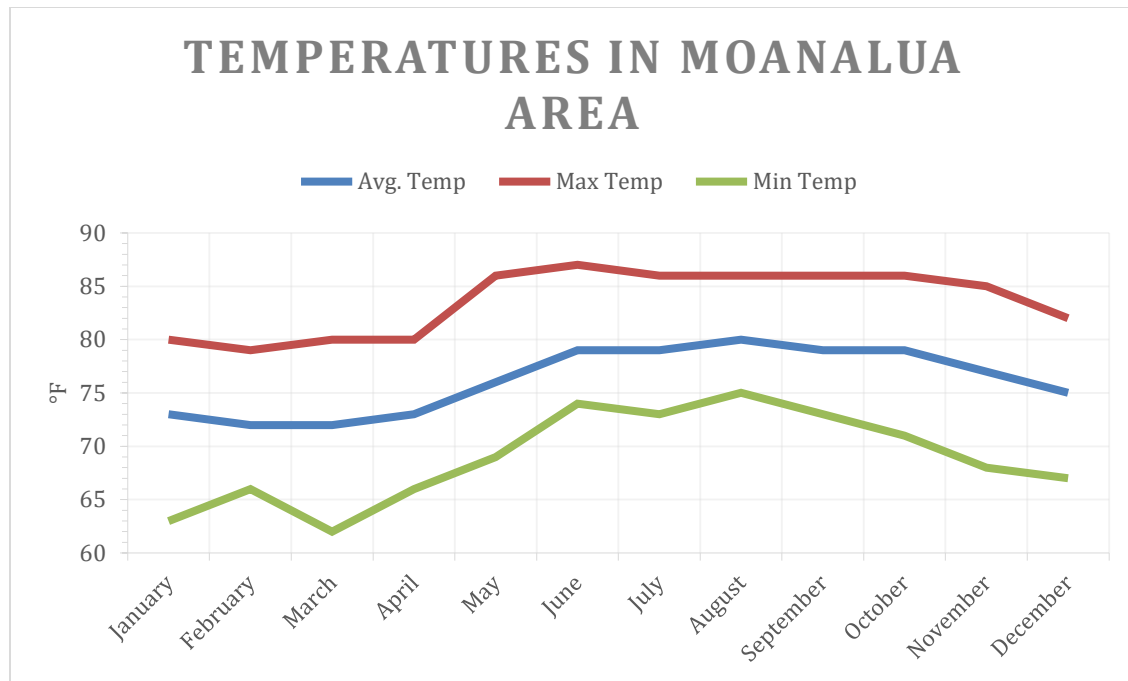


Figure 19: Graph of the temperature in the Moanalua area.

Source: Data collected from areavibes.¹²⁹ Graph made by Author.

Air Quality

Table 8: Air Quality in Moanalua

Measurement	Days
Days measured	365
Days with good air quality	347
Days with moderate air quality	18

Source: areavibes. 2015. Diamond Head - Kapahulu Weather. Accessed April 13, 2015.
<http://www.areavibes.com/honolulu-hi/moanalua/weather/>

¹²⁹ areavibes. 2015. Diamond Head - Kapahulu Weather. Accessed April 13, 2015.
<http://www.areavibes.com/honolulu-hi/moanalua/weather/>

Architectural Drawings



Figure 20: The Plaza at Moanalua Memory Care Floor Plan. Courtesy of Wattenburger Architects.¹³⁰

¹³⁰ Drawing Courtesy of Wattenburger Architects.

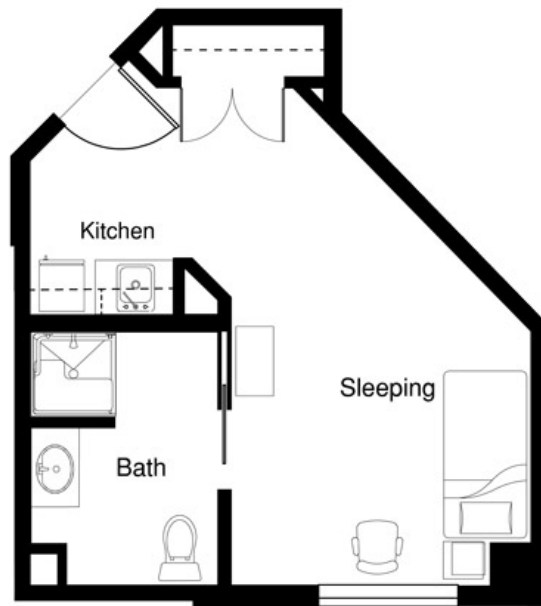


Figure 21: The Plaza at Moanalua Memory Care Studio Sample Floor Plan.¹³¹

¹³¹ The Plaza Assisted Living. 2015. The Plaza Assisted Living at Moanalua. Accessed April 21, 2015. <http://www.theplazaassistedliving.com/locations/moanalua>.



Figure 22: The Plaza at Moanalua Memory Care Semi-Private Sample Floor Plan.¹³²

¹³² The Plaza Assisted Living. 2015. The Plaza Assisted Living at Moanalua. Accessed April 21, 2015. <http://www.theplazaassistedliving.com/locations/moanalua>.



Figure 23: The Plaza at Moanalua Memory Care One Bedroom Sample Floor Plan.¹³³

¹³³ The Plaza Assisted Living. 2015. The Plaza Assisted Living at Moanalua. Accessed April 21, 2015. <http://www.theplazaassistedliving.com/locations/moanalua>.

Cost and Activities Information

Cost

Table 9: Cost of Rooms at the Plaza at Moanalua Information provided by Administrator Shannon Miyazaki.¹³⁴

Memory Care Room Type	Monthly Cost	Federal Assistance
Private	Starting at \$5,475*	\$0
Semi-Private	\$6,050*	\$0
Studio	\$7,750*	\$0
Additional Room Options		
Assisted Living Semi-Private	Starting at \$5,475*	\$0
Assisted Living Studio	Starting at \$7,175*	\$0
Independent Living Semi-Private	Starting at \$3,450*	\$0
Independent Living Studio	Starting at \$4,350*	\$0
Independent Living 1-Bedroom	Starting at \$ 5,475*	\$0
Independent Living 2 nd Occupant	\$900	\$0

*Most amenities are included.

¹³⁴ Ibid.

Activities

Below is an example of activities the residents at the Plaza at Moanalua would experience on a monthly basis.

March 2015						
Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 10:00 - Unwound Unwind Ride - Long / Signify 1:00 - Sing Along 2:00 - Zumba Gold Exercise 2:00 - Unwound Unwind Ride - Long / Signify 3:00 - Game - Hanaridhi / Mah Jong	9:00 - Exercise 1 10:00 - Performance - Conestoga Fellowship 10:00 - Game - Sam Parrick's Word Jugg 1:00 - Exercise 2 2:00 - Cooking Corner 2:45 - Dog Pet Visit Lila & Sam-de 3:00 - BINGO 9:00 - Exercise 1 10:00 - Dog Pet Visit Book 10:15 - Exercise 2 1:00 - Game - Wii Just Dance 2:00 - Game - Cup Stacker 2:00 - Unwound Unwind Ride - Long / Signify 3:00 - Craft - Fossil Shamrock Shirt	9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Craft - Blossom Pinning 2:00 - Cooking Corner 2:45 - Dog Pet Visit Lila & Sam-de 3:00 - BINGO 9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:15 - Gardening 2:00 - Resident Council 2:45 - Dog Pet Visit Lila & Sam-de 3:00 - BINGO 6:30 - Birthday Bash Social	9:00 - Exercise 1 9:00 - Sami Bar Ride - Esq 10:00 - Calligraphy with Linda 1:00 - Beautiful You 2:00 - Sami Bar Ride - Esq 2:00 - Exercise 2 3:00 - Game - Ping Pong Toss 9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Beautiful You 2:00 - Sami Bar Ride - Esq 2:00 - Exercise 2 3:00 - Game - Ping Pong Toss	9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Game - Sam Parrick's Word Jugg 2:00 - Mini Performance 2:00 - Pacific Game Players 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO 9:00 - Exercise 1 10:00 - Unwound with Jolee & Mike 1:00 - Game - Minute To Win It 2:00 - Korean Drama Hour "Potato Boy" Ep. 40 2:00 - Exercise 2 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO	9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Game - Sam Parrick's Word Jugg 2:00 - Mini Performance 2:00 - Pacific Game Players 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO 9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Game - Sam Parrick's Word Jugg 2:00 - Mini Performance 2:00 - Pacific Game Players 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO	9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Game - Sam Parrick's Word Jugg 2:00 - Mini Performance 2:00 - Pacific Game Players 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO 9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Game - Sam Parrick's Word Jugg 2:00 - Mini Performance 2:00 - Pacific Game Players 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO
9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Sing Along 2:00 - Zumba Gold Exercise 2:00 - Unwound Unwind Ride - Long / Signify 3:00 - Game - Hanaridhi / Mah Jong	9:00 - Exercise 1 10:00 - Performance - Conestoga Fellowship 10:00 - Game - Sam Parrick's Word Jugg 1:00 - Exercise 2 2:00 - Cooking Corner 2:45 - Dog Pet Visit Lila & Sam-de 3:00 - BINGO 9:00 - Exercise 1 10:00 - Dog Pet Visit Book 10:15 - Exercise 2 1:00 - Game - Wii Just Dance 2:00 - Game - Cup Stacker 2:00 - Unwound Unwind Ride - Long / Signify 3:00 - Craft - Fossil Shamrock Shirt	9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Craft - Blossom Pinning 2:00 - Cooking Corner 2:45 - Dog Pet Visit Lila & Sam-de 3:00 - BINGO 9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:15 - Gardening 2:00 - Resident Council 2:45 - Dog Pet Visit Lila & Sam-de 3:00 - BINGO 6:30 - Birthday Bash Social	9:00 - Exercise 1 9:00 - Sami Bar Ride - Esq 10:00 - Calligraphy with Linda 1:00 - Beautiful You 2:00 - Sami Bar Ride - Esq 2:00 - Exercise 2 3:00 - Game - Ping Pong Toss 9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Beautiful You 2:00 - Sami Bar Ride - Esq 2:00 - Exercise 2 3:00 - Game - Ping Pong Toss	9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Game - Sam Parrick's Word Jugg 2:00 - Mini Performance 2:00 - Pacific Game Players 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO 9:00 - Exercise 1 10:00 - Unwound with Jolee & Mike 1:00 - Game - Minute To Win It 2:00 - Korean Drama Hour "Potato Boy" Ep. 40 2:00 - Exercise 2 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO	9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Game - Sam Parrick's Word Jugg 2:00 - Mini Performance 2:00 - Pacific Game Players 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO 9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Game - Sam Parrick's Word Jugg 2:00 - Mini Performance 2:00 - Pacific Game Players 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO	9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Game - Sam Parrick's Word Jugg 2:00 - Mini Performance 2:00 - Pacific Game Players 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO 9:00 - Exercise 1 10:00 - Current Events 10:00 - Exercise 2 1:00 - Game - Sam Parrick's Word Jugg 2:00 - Mini Performance 2:00 - Pacific Game Players 2:00 - Unwound Unwind Ride - Manda 3:00 - BINGO

Figure 24: Activities provided by Administrator Shannon Miyazaki.¹³⁵

¹³⁵ Ibid.

Typical Day in the Life of a Resident at The Plaza at Moanalua

Table 10: Typical Daily Schedule.

Time	Activity
6:00 AM	Wake up/morning care (brush teeth, shave/apply makeup, change clothes)
7:00 AM	Read newspaper
7:30 AM	Breakfast
8:30 AM	Restroom/rest
9:00 AM	Exercise class
10:00 AM	Van ride
11:00 AM	Socialize with friends in the bistro
11:30 AM	Lunch
12:30 PM	Restroom/rest
1:00 PM	Tai chi
2:00 PM	Craft class
3:00 PM	Bingo
4:00 PM	Socialize with friends in the bistro
4:30 PM	Dinner
5:30 PM	Restroom/rest/television (news)
6:30 PM	Coffee social hour
8:00 PM	Evening care (bathing and brush teeth)
9:00 PM	Television (Korean drama) in individual rooms
10:00 PM	Sleep

Source: Shannon Miyazaki.¹³⁶

¹³⁶ Ibid.

Case Study 3: The Plaza at Mililani (ALF, Memory Care)



Figure 25: Exterior view of The Plaza at Mililani.¹³⁷

Project Location Mililani, Oahu
Architect Wattenburger Architects

¹³⁷ MW Group, Ltd. 2015. The Plaza Assisted Living. Accessed April 20, 2015.
<http://www.mwgroup.com/property/plaza-mililani>

Table 11: Building and Resident Information for the Plaza at Mililani.

Building Information		Resident Information	
Number of Units	128	Age Range	70-90
Number of Floors	4	Average Age	80
Facility Type	Independent Living	Number of Residents	100
	Assisted Living	Number of Men	25
	Memory Care	Number of Women	75
	Respite Care	Number of Couples	1-2
Room Types	2 Bedroom Suite		
	1-Bed Room		
	Studio		
Completion Date	2010		

Project History

Like the Plaza at Moanalua, the Plaza at Mililani is another member of the Plaza Assisted Living group. The Plaza at Mililani is the second of the five locations and was completed in February of 2010, six years after the first opened its doors in Punchbowl.

One of the major challenges the architects faced when designing the Plaza at Mililani was how to blend the site with the existing context. In the figures below, you can see that the Olaloa Retirement Community is a neighbor and boasts a two-story apartment building design. The challenge, then, was how to fit the building itself on the site and how to create a similar design typology to that of the neighbors. The solution they came up with was to alter the floor plan to accommodate the shape of the site and make the exterior of the facility look more like a house.



Figure 26: The Plaza at Mililani is located on Oahu.¹³⁸



¹³⁸ Image from Google Earth

Figure 27: The Plaza at Mililani is located on Oahu¹³⁹

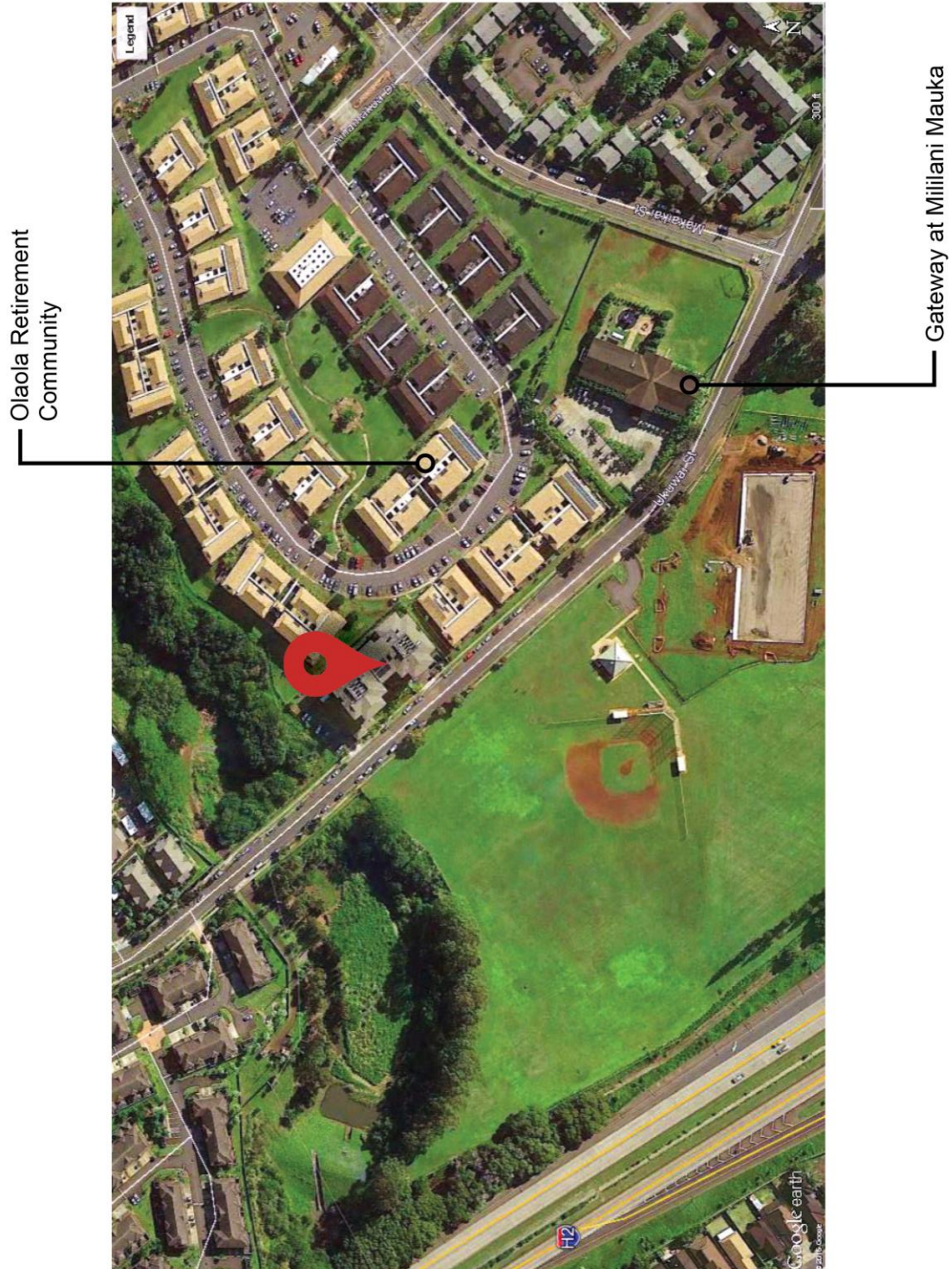


Figure 28: The Plaza at Mililani is located on Oahu.¹⁴⁰

¹³⁹ Image from Google Earth

Demographics of the Surrounding Area

The Plaza at Mililani is located in Mililani Mauka. The current population of Mililani Mauka is 19,247 with a median age of 34. Mililani Mauka's median household income is \$106,048, and the average household net worth is \$1,098,292. Twenty-five percent of Mililani Mauka's population is comprised of long-term residents who have lived in their homes for more than 5 years, while another twenty-five percent of the population has moved there within the last year.¹⁴¹

Thirty-seven percent of Mililani Mauka residents are college graduates, and over 50 percent are married with children. Many residents are property owners. Just over 46 percent of residents are between the ages of 20 and 49. The top career fields are education, sales, and business, from office administration to the executive level.¹⁴²

This case study is located off Ukawai Street. Mililani Mauka Elementary is the only school within walking distance of the Plaza. The Mililani Mauka Shopping Center is also within walking distance. Across the street is a dog park as well as a baseball field. From the Plaza's second floor, you can see the H-2 in the distance, but the traffic is barely audible. The Olaloa Retirement Community is located just behind the Plaza. The site on which the Plaza sits is surrounded by green vegetation. The overall noise quality is not bad; the street on which the Plaza is located is busy, but the noise levels are not so loud that they would agitate any of the residents.

¹⁴⁰ Image from Google Earth

¹⁴¹ Realtor.com. 2014. Mililani Mauka, HI. Accessed April 23, 2015.
http://www.realtor.com/local/Mililani-Mauka_HI/lifestyle.

¹⁴² Realtor.com. 2014. Mililani Mauka Information. Accessed April 23, 2015.
http://www.realtor.com/local/Mililani-Mauka_HI.

Environmental Information

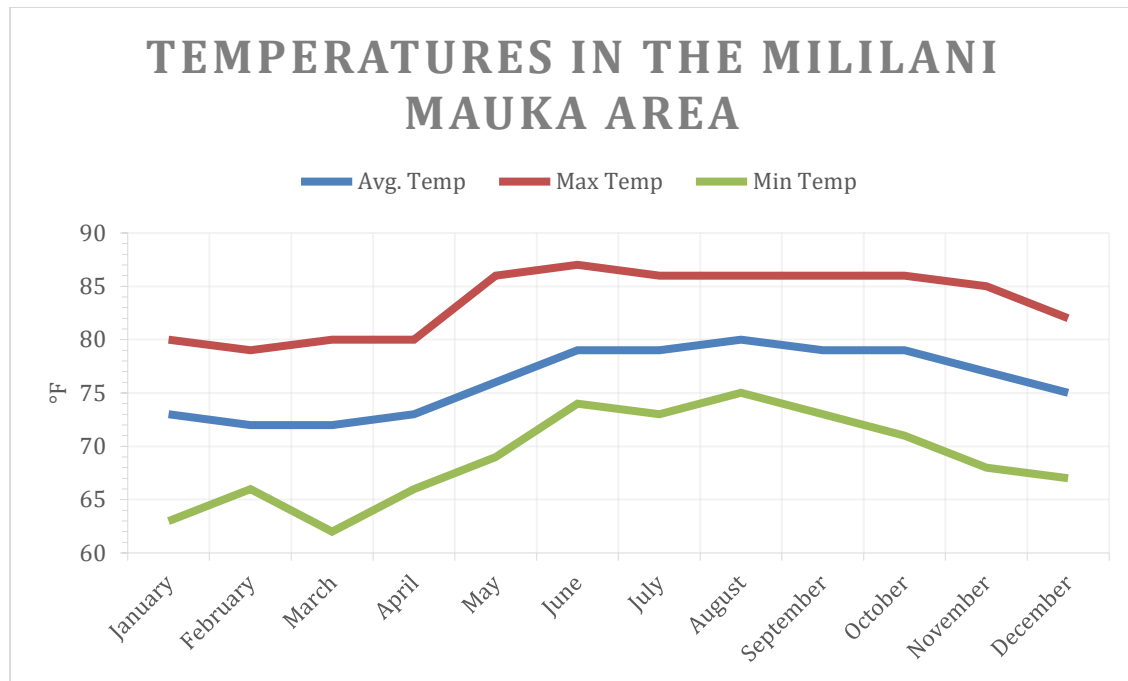


Figure 29: Graph of the temperature in the Mililani Mauka area.

Source: Data collected from areavibes.¹⁴³ Graph made by Author.

Air Quality

Table 12: Air Quality in Mililani Mauka Area.

Measurement	Total
Days measured	365
Days with good air quality	347
Days with moderate air quality	18

Source: areavibes. 2015. Mililani-Waipio-Melemanu. Accessed April 13, 2015.
<http://www.areavibes.com/honolulu-hi/mililani-waipio-melemanu/weather/>

¹⁴³ areavibes. 2015. Mililani-Waipio-Melemanu. Accessed April 13, 2015.
<http://www.areavibes.com/honolulu-hi/mililani-waipio-melemanu/weather/>

Architectural Drawings



Figure 30: The Plaza at Mililani Memory Care Floor Plan¹⁴⁴

¹⁴⁴ Drawing Courtesy of Wattenburger Architects.

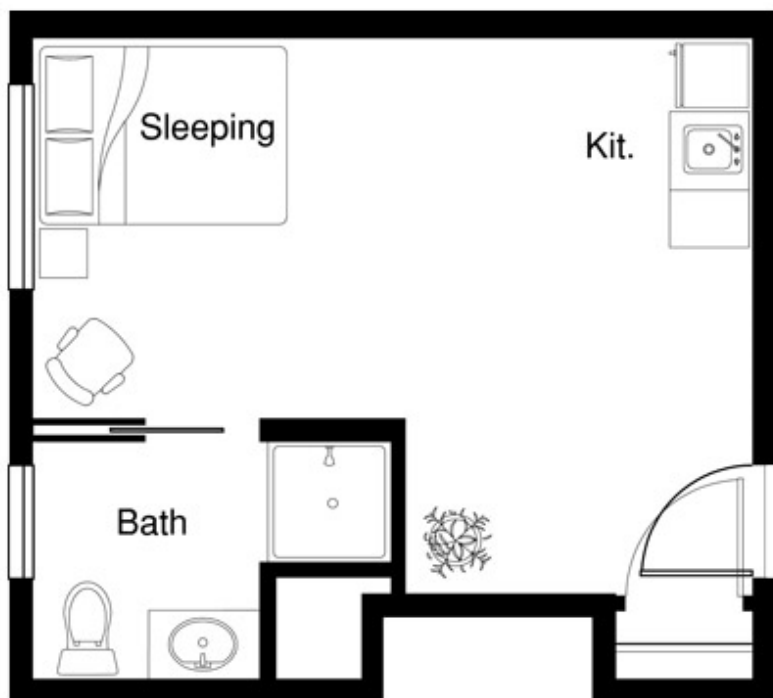


Figure 31: The Plaza at Mililani Memory Care Studio Sample Floor Plan.¹⁴⁵

¹⁴⁵ The Plaza Assisted Living. 2015. The Plaza Assisted Living at Moanalua. Accessed April 22, 2015. <http://www.theplazaassistedliving.com/locations/mililani>.

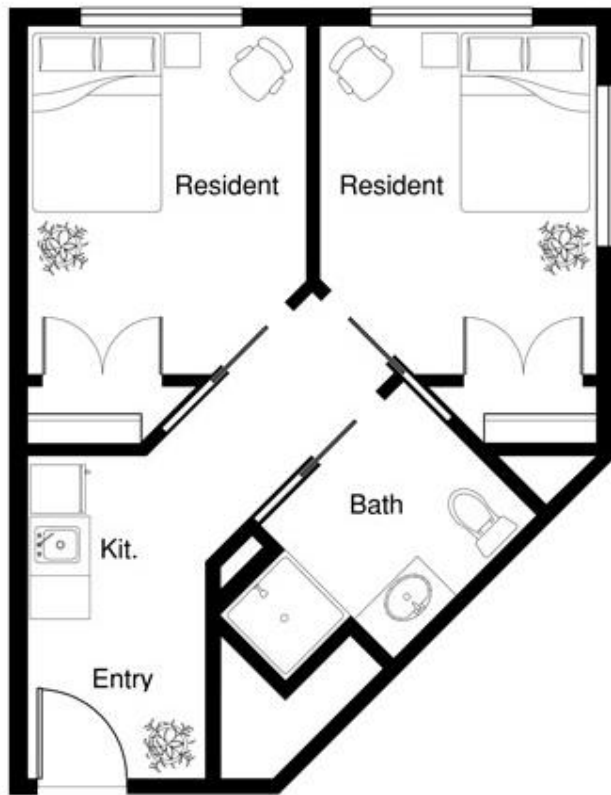


Figure 32: The Plaza at Mililani Memory Care Semi-Private Sample Floor Plan.¹⁴⁶

¹⁴⁶ The Plaza Assisted Living. 2015. The Plaza Assisted Living at Moanalua. Accessed April 22, 2015. <http://www.theplazaassistedliving.com/locations/mililani>.

Cost and Activities Information

Cost

Table 13: Cost of Rooms at the Plaza at Mililani. Information provided by Residence Relations Manager Jarrett Chun.¹⁴⁷

Memory Care Room Type	Monthly Cost	Federal Assistance
Private	Starting at \$5,475	\$0
Semi-Private	\$6,050	\$0
Studio	\$7,750	\$0
Additional Room Options		
Assisted Living Semi-Private	Starting at \$5,475	\$0
Assisted Living Studio	Starting at \$7,175	\$0
Independent Living Semi-Private	Starting at \$3,450	\$0
Independent Living Studio	Starting at \$4,350	\$0
Independent Living 1-Bedroom	Starting at \$ 5,475	\$0
Independent Living 2 nd Occupant	\$900	\$0

¹⁴⁷ Ibid.

Activities

Below is an example of activities the residents at the Plaza at Moanalua might experience during the month.

<div> <div>THE PLAZA — of MILLICENT</div> <div>APRIL 2015</div> <div>2nd & 5th Floor</div> </div>						
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
5 EASTER SUNDAY Buffet seating 10 am & 12 pm All activities moved to 5th flr. 9:45 Exercise 10:00 No Van Rides 10:15 100 Balloon Wrepping 11:30 Talk Story Ind. Games 1:15 Afternoon Stretch 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	6 Brain Games - Individual 9:45 Current Events 10:00 Exercise 10:45 Art - Spring Activities 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	7 Brain Games - Individual 9:45 Current Events 10:00 Exercise 10:45 Talk Story Ind. Games 1:30 Afternoon Stretch 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	1 7 th Flr. Van Ride - Kinsale 9:45 Brain Games - Individual 10:00 Exercise 10:45 David Kim Sing-Along 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	2 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	3 GOOD FRIDAY 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	4 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO
12 9:45 Brain Games - Individual 10:00 Exercise 10:45 Down Memory Lane 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	13 9:45 Brain Games - Individual 10:00 Exercise 10:45 Art - Spring Activities 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	14 9:45 Brain Games - Individual 10:00 Exercise 10:45 Places of Science 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	15 9:45 Brain Games - Individual 10:00 Exercise 10:45 Places of Science 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	16 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	17 9:45 Brain Games - Individual 10:00 Exercise 10:45 Land Sing-Along 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	18 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO
19 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	20 9:45 Brain Games - Individual 10:00 Exercise 10:45 Art - Spring Activities 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	21 9:45 Brain Games - Individual 10:00 Exercise 10:45 Places of Science 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	22 EARTH DAY 9:45 Brain Games - Individual 10:00 Exercise 10:45 David Kim Sing-Along 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	23 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	24 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	25 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO
26 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	27 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	28 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	29 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	30 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	31 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO	1 9:45 Brain Games - Individual 10:00 Exercise 10:45 Connective Fellowship 1:30 Talk Story Ind. Games 2:15 Afternoon Stretch 3:15 Afternoon Stretch 4:00 BINGO

Figure 33: Activities provided by Administrator Dawn Meaney.¹⁴⁸

¹⁴⁸ Dawn Meaney, email message to author, April 21, 2015

Typical Day in the Life of a Resident at The Plaza at Mililani

Table 14: Typical Daily Schedule at The Plaza at Mililani.¹⁴⁹

Time	Activity
6:00 AM	Wake up/morning care (brush teeth, shave/apply makeup, change clothes)
7:00 AM	Read newspaper
7:30 AM	Breakfast
8:30 AM	Restroom/rest
9:00 AM	Exercise class
10:00 AM	Van ride
11:00 AM	Socialize with friends in the bistro
11:30 AM	Lunch
12:30 PM	Restroom/rest
1:00 PM	Tai chi
2:00 PM	Craft class
3:00 PM	Brain Game
4:00 PM	Socialize with friends in the bistro
4:30 PM	Dinner
5:30 PM	Restroom/rest/television (news)
6:30 PM	Coffee social hour
8:00 PM	Evening care (bathing and brush teeth)
9:00 PM	Television (Korean drama) in individual rooms
10:00 PM	Sleep

¹⁴⁹ Jarrett Chubn. email message to author, June 15, 2015

Case Study 4: Kahala Nui – Hi’olani Care Center (CCRC)



*Figure 34: Exterior view of Kahala Nui.*¹⁵⁰

Project Location Kahala, Oahu

Architect Three Architecture in collaboration with Architects Hawai'i

¹⁵⁰ PBR Hawaii. n.d. Kahala Nui - Senior Living. Accessed April 24, 2015.
<http://pbrhawaii.com/?project=kahala-nui-senior-living>.

Table 15: Building and Resident Information for the Kahala Nui – Hi'olani Care Center.

Building Information		Resident Information	
Number of Units	**	Age Range	**
Number of Floors	6	Average Age	**
Facility Type	Assisted Living	Number of Residents	**
	Comprehensive Nursing	Number of Men	**
	CCRC	Number of Women	**
	Memory Care	Number of Couples	**
Room Types	1 Bedroom Suite (Assisted Living)		
	Alcove Suite (Assisted Living)		
	Private Suite (Comprehensive Nursing)		
	Studio		
Completion Date	2010		

** Administrators at Kahala Nui requested actual numbers not be provided. This author is respecting their wish by not placing any numbers in these boxes.

Project History

Kahala Nui originally opened in 1989 and was called the Visacal Homes of Hawai'i, but failed. This did not sit well with many of the board members, and so in 2003, the board broke ground a second time and in 2005, opened Kahala Nui's doors.¹⁵¹

The goal of Kahala Nui was to create something attractive with amenities that together create a worry-free environment for the older adult residents.¹⁵² The

¹⁵¹ Duarte, Pat, interview by Kim Gennaula. 2013. "Kahala Nui." Menpachi Production. (June 21). Accessed April 24, 201. <https://www.youtube.com/watch?v=45zf3lX5suE>.

¹⁵² Ibid.

philosophy is to provide a “person-centered” care through assisted living, memory support, and comprehensive nursing.¹⁵³

Kahala Nui Hi’olani Care Center was designed by Three Architecture and Architects Hawai’i Ltd. This new project was completed in 2010. The landscaping was completed by PBR Hawai’i and the interior by Philpotts & Associates. Within the care center, there are forty-one assisted living suites, twenty-two memory support suites, and sixty nursing beds.¹⁵⁴

¹⁵³ Kahala Nui. n.d. Hi’olani Care Center at Kahala Nui. 2.

¹⁵⁴ Ibid., 3.



Figure 35: Hi'olani Care Center at Kahala Nui is located on Oahu.¹⁵⁵

¹⁵⁵ Image from Google Earth

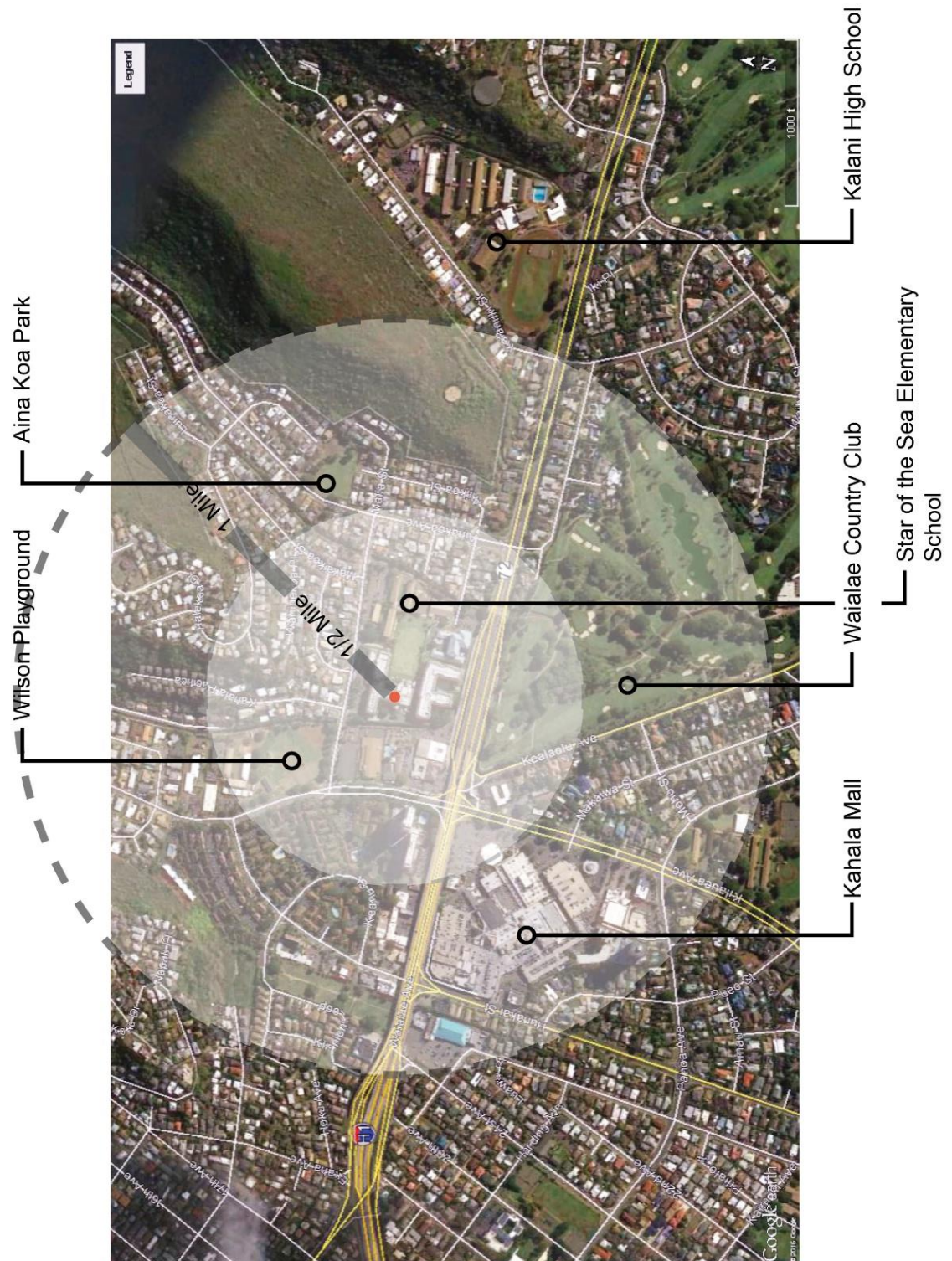


Figure 36: Hi'olani Care Center at Kahala Nui is located on Oahu.¹⁵⁶

¹⁵⁶ Image from Google Earth

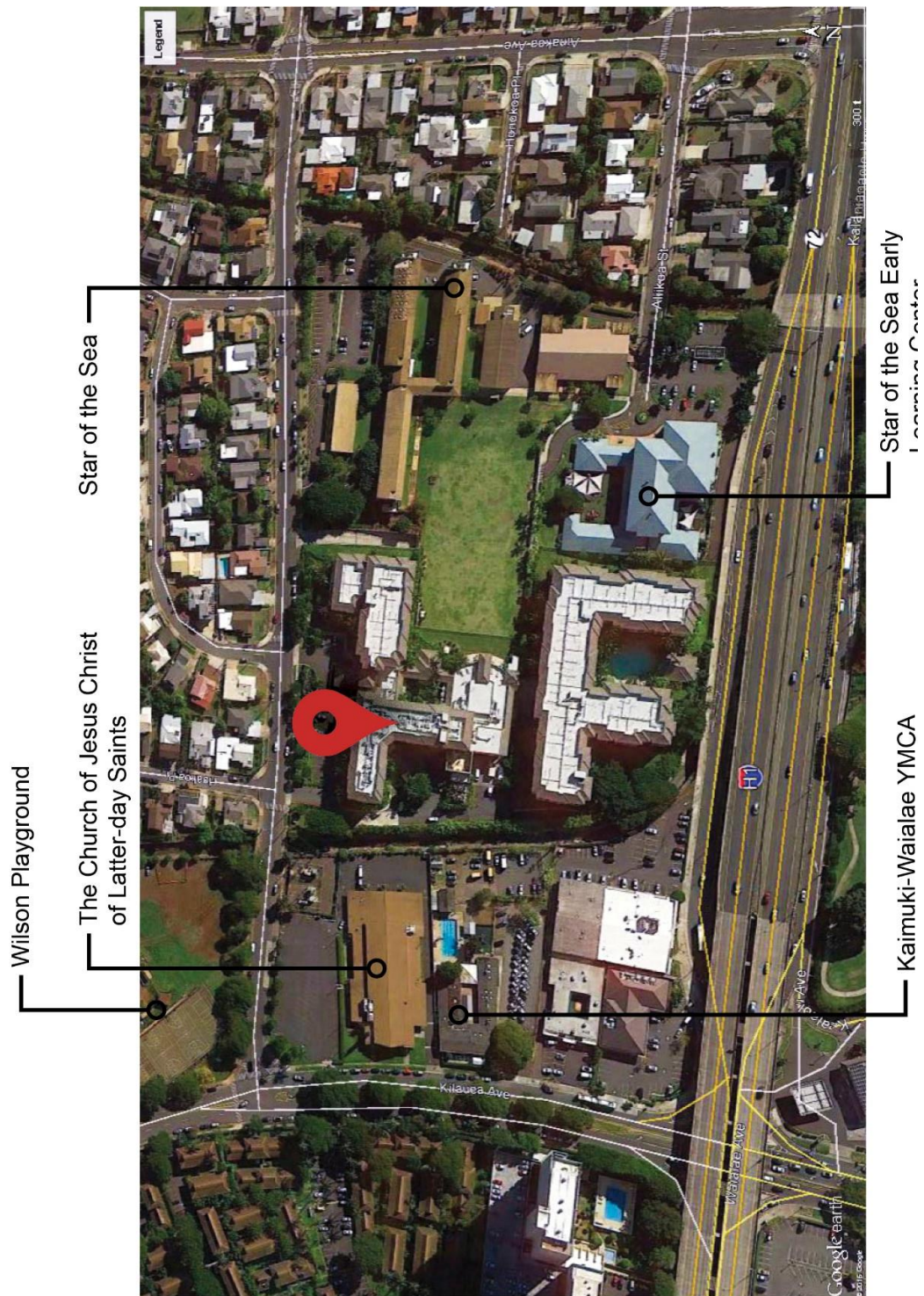


Figure 37: Hi'olani Care Center at Kahala Nui is located on Oahu.¹⁵⁷

¹⁵⁷ Image from Google Earth

Demographics of the Surrounding Area

Kahala Nui is located in the Waialae - Kahala area. The current population of Waialae - Kahala is 9,296 with a median age of 50. The area's median household income is \$109,999, and the average household net worth is \$1,257,313. Fifty-four percent of the area's population is comprised of long-term residents who have lived in their homes for more than 5 years, while twelve percent of the population has moved there within the last year.¹⁵⁸

Almost 47 percent of residents are college graduates, and almost 50 percent are married. Many residents are property owners, and over 42 percent of residents are between the ages of 40 and 69. Top career fields represented in Waialae - Kahala are sales, education, and business, from office administration to the executive level.¹⁵⁹

This case study is located off Malia Street. There are two schools, Wilson Elementary School and Star of the Sea, within walking distance. Also within walking distance are the Kahala Mall and Wilson Park. The immediate area surrounding the facility is exceptionally peaceful with an abundance of trees and vegetation. The overall noise quality is not bad; the street on which the center is located is busy, but the noise levels are not so loud that they would agitate any of the residents.

¹⁵⁸ Realtor.com. 2015. Waialae - Kahala, East Honolulu, HI. Accessed April 25, 2015. http://www.realtor.com/local/Waialae-Kahala_East-Honolulu_HI/lifestyle.

¹⁵⁹ —. 2015. Waialae - Kahala Information. Accessed April 25, 2015. http://www.realtor.com/local/Waialae-Kahala_East-Honolulu_HI.

Environmental Information

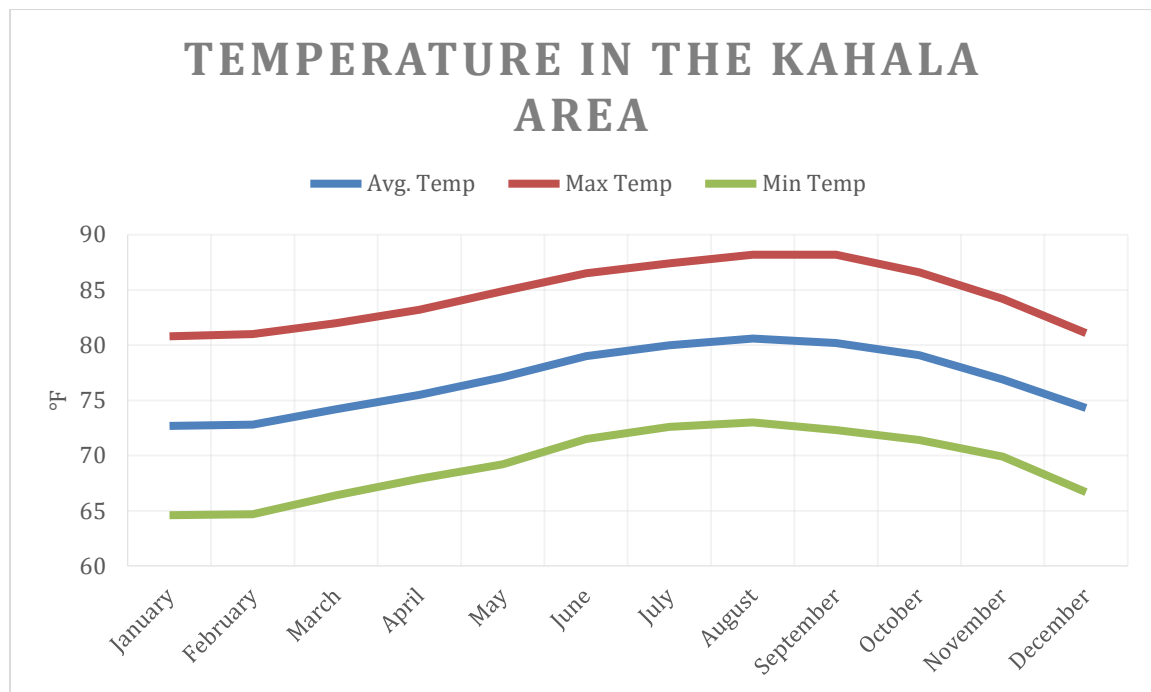


Figure 38: Graph of the temperature in the Kahala area.

Source: Data collected from areavibes¹⁶⁰. Graph made by author.

Air Quality

Table 16: Air Quality in Kahala Area.

Measurement	Total
Days measured	365
Days with good air quality	347
Days with moderate air quality	18

Source: areavibes. 2015. Waialae-Kahala Air Quality Information. Accessed April 13, 2015. <http://www.areavibes.com/honolulu-hi/waialae-kahala/weather/>.

¹⁶⁰ areavibes. 2015. Waialae-Kahala Air Quality Information. Accessed April 13, 2015. <http://www.areavibes.com/honolulu-hi/waialae-kahala/weather/>.

Architectural Drawings

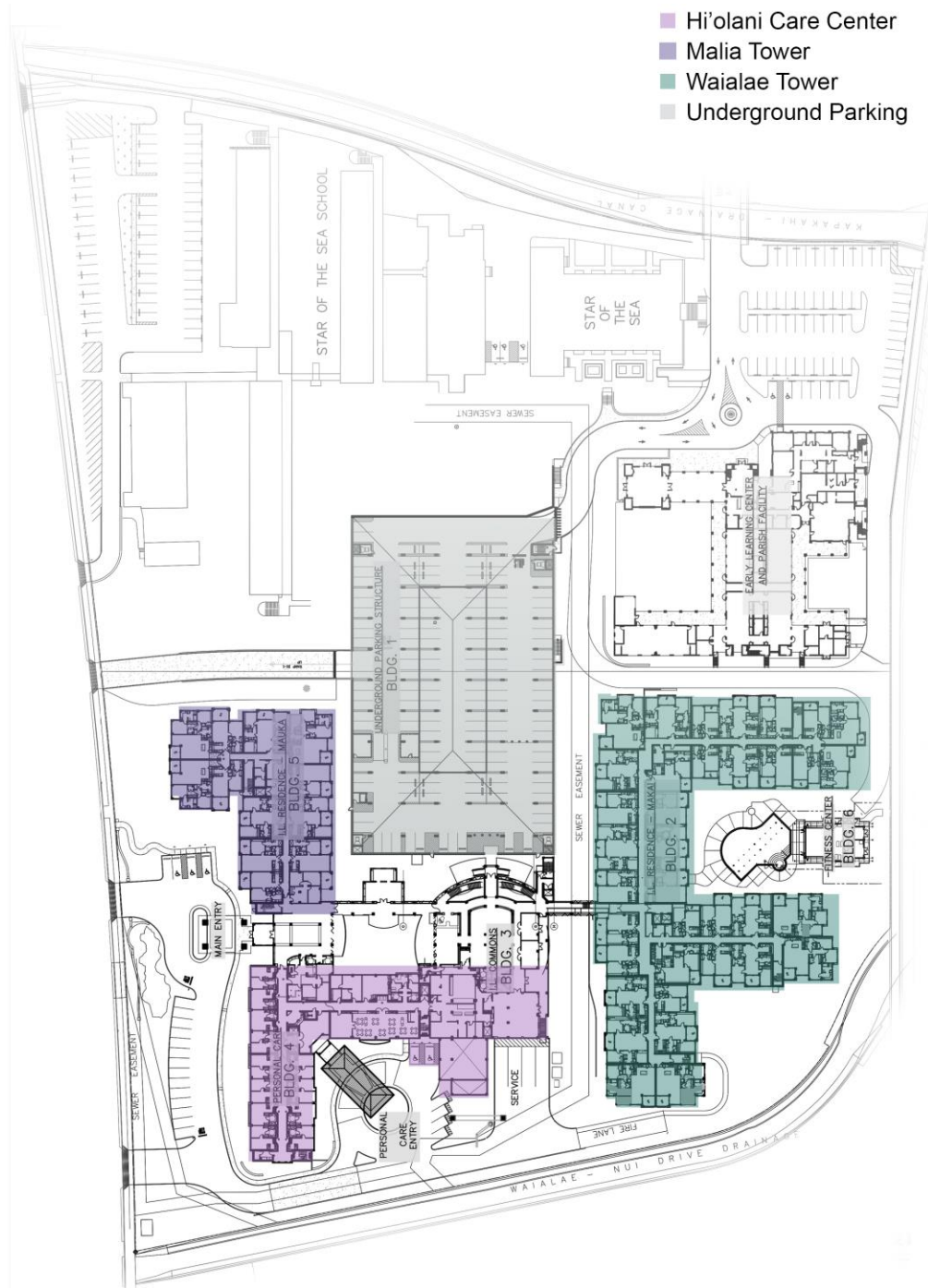


Figure 39: Kahala Nui Site Plan. Courtesy of Mariel Moriwake from Architects Hawai'i Ltd.¹⁶¹

¹⁶¹ Kahala Nui Site Plan. Courtesy of Architects Hawai'i Ltd.

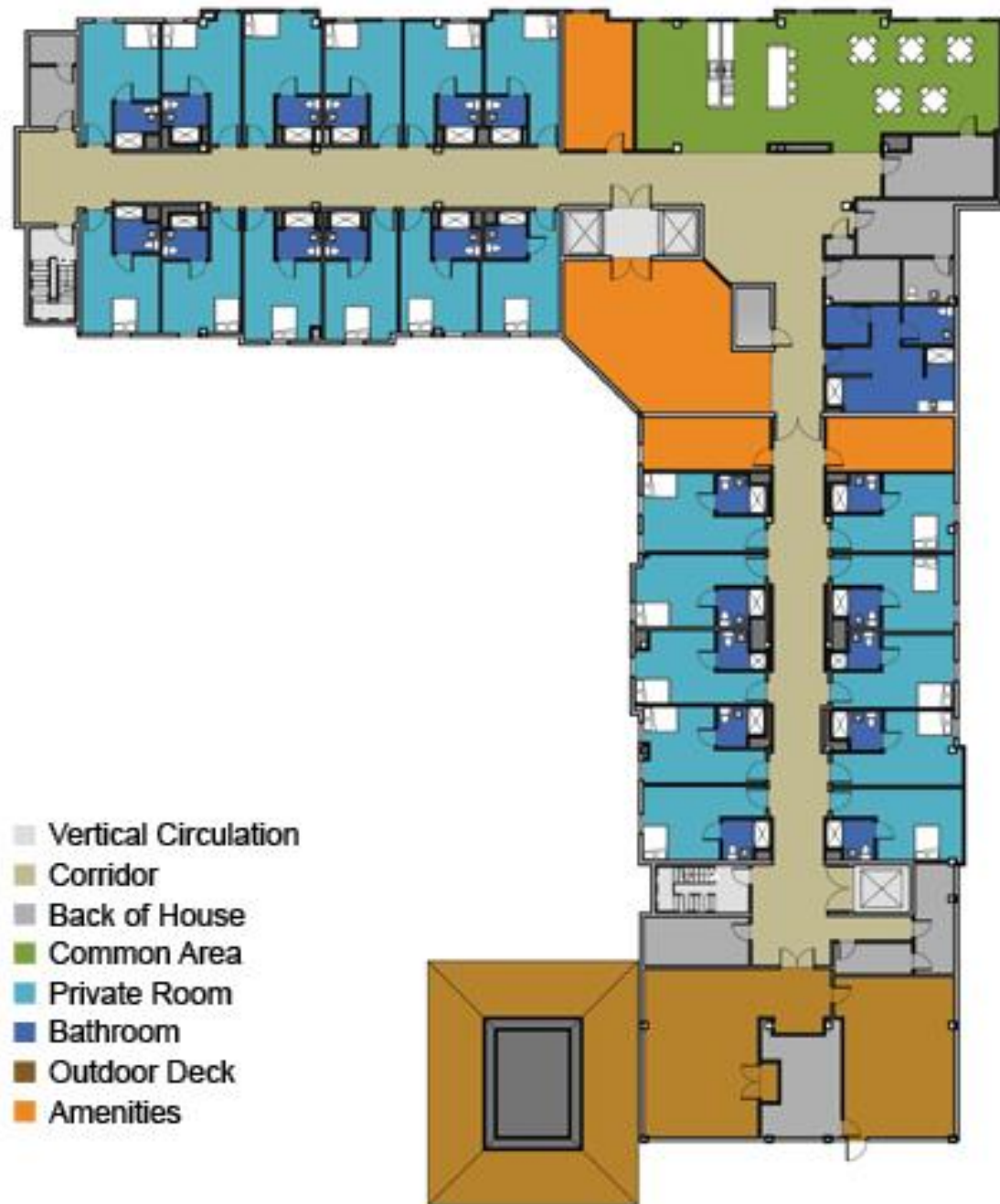


Figure 40: Kahala Nui Hi'olani Care Center Floor Plan. Source: Mariel Moriwake of Architects Hawai'i Ltd. Floor Plan edited by author.¹⁶²

¹⁶² Ibid.

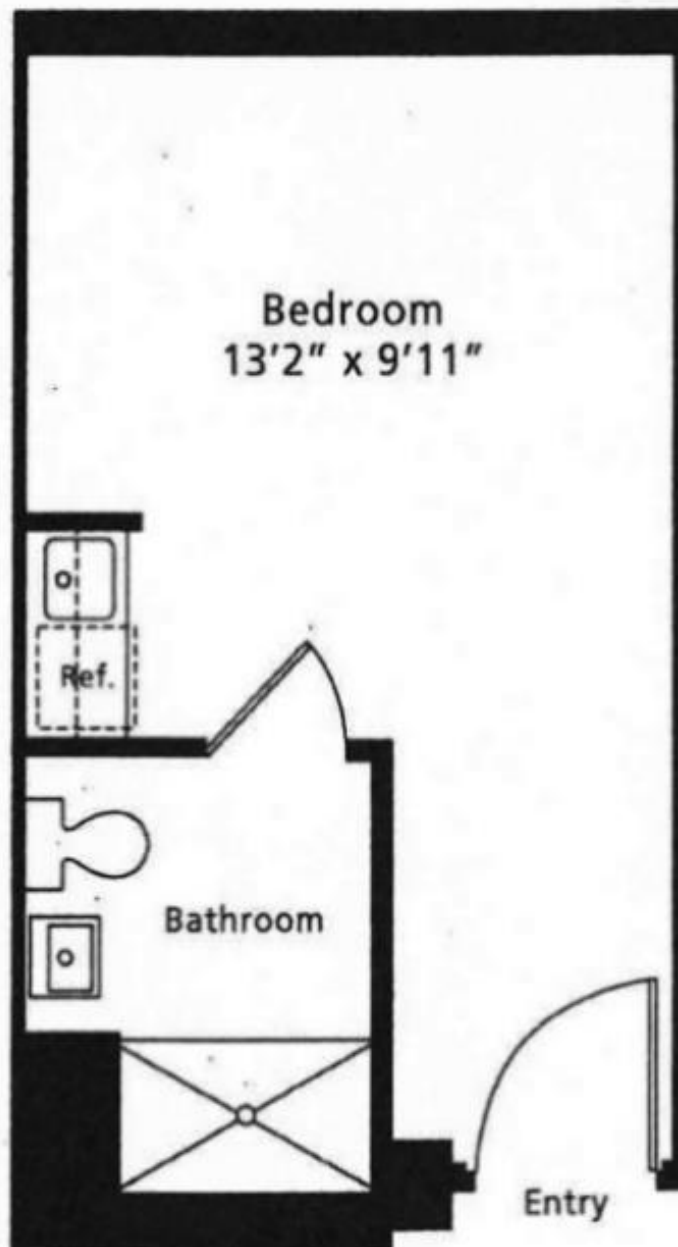


Figure 41: Kahala Nui – Hi'olani Care Center Assisted Living One Bedroom Floor Plan.¹⁶³

¹⁶³ Kahala Nui. n.d. Hi'olani Care Center at Kahala Nui. 1.

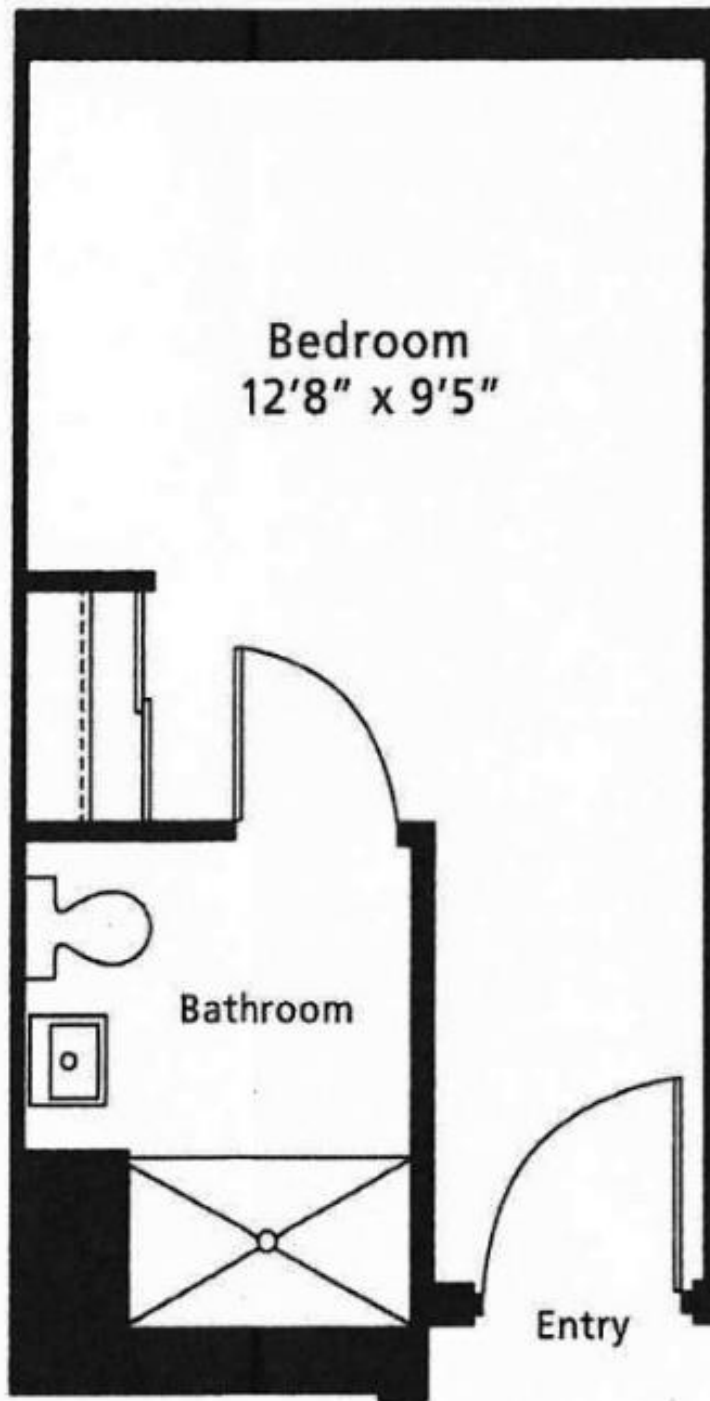


Figure 42: Kahala Nui – Hi'olani Care Center Assisted Living Alcove Bedroom.¹⁶⁴

¹⁶⁴ Ibid.

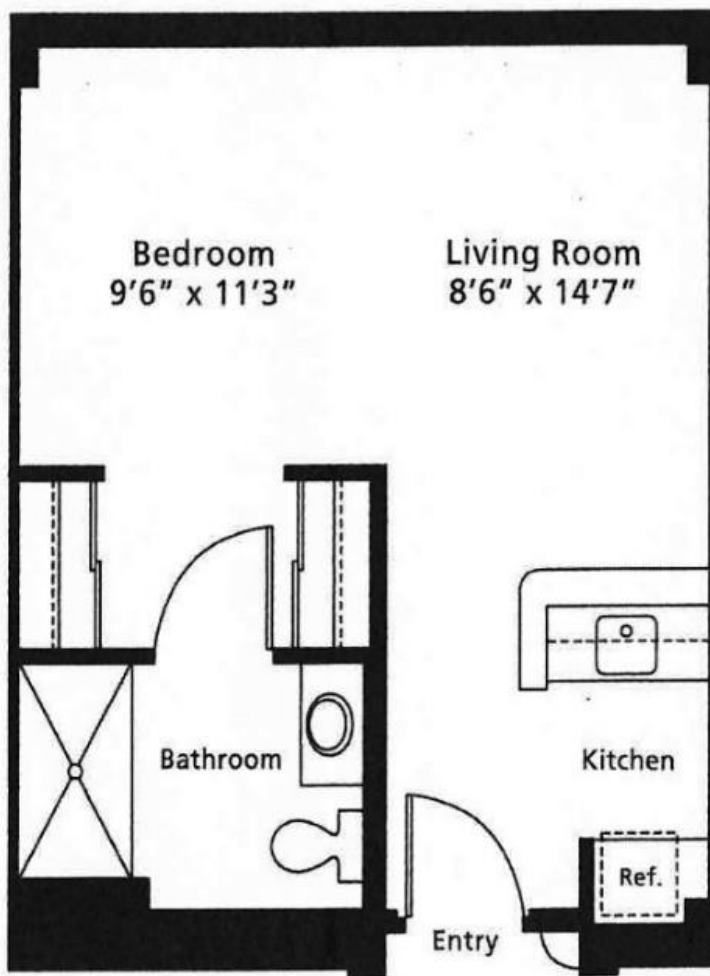


Figure 43: Kahala Nui – Hi'olani Care Center Assisted Living Alcove Bedroom.¹⁶⁵

¹⁶⁵ Ibid.

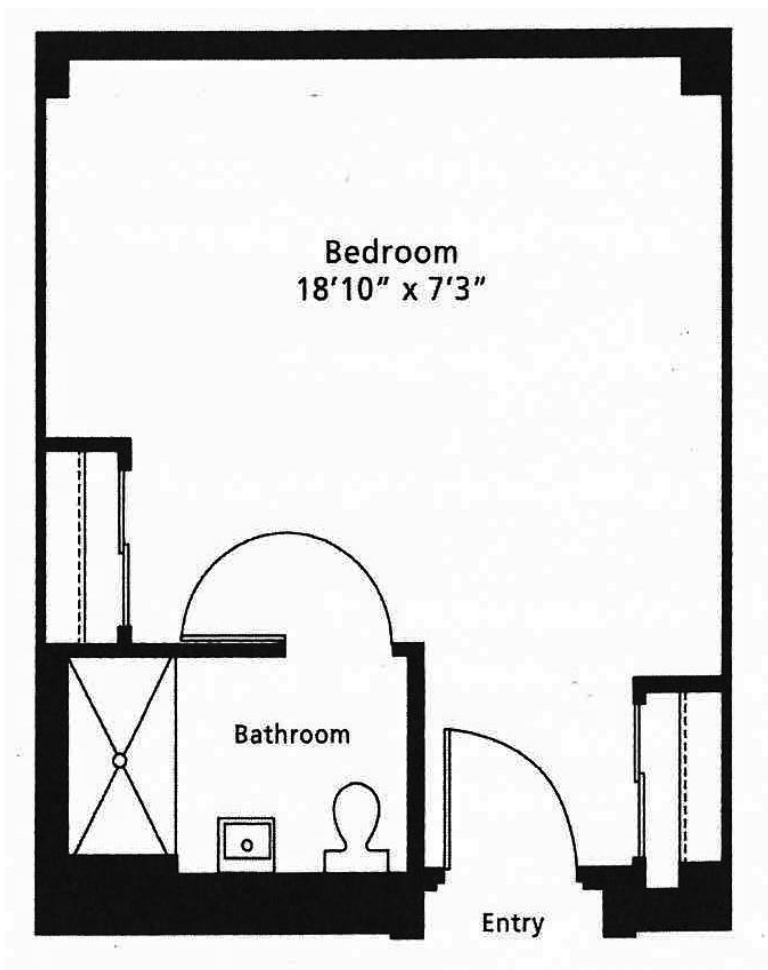


Figure 44: Kahala Nui – Hi'olani Care Center Comprehensive Nursing Private Bedroom.¹⁶⁶

¹⁶⁶ Ibid.

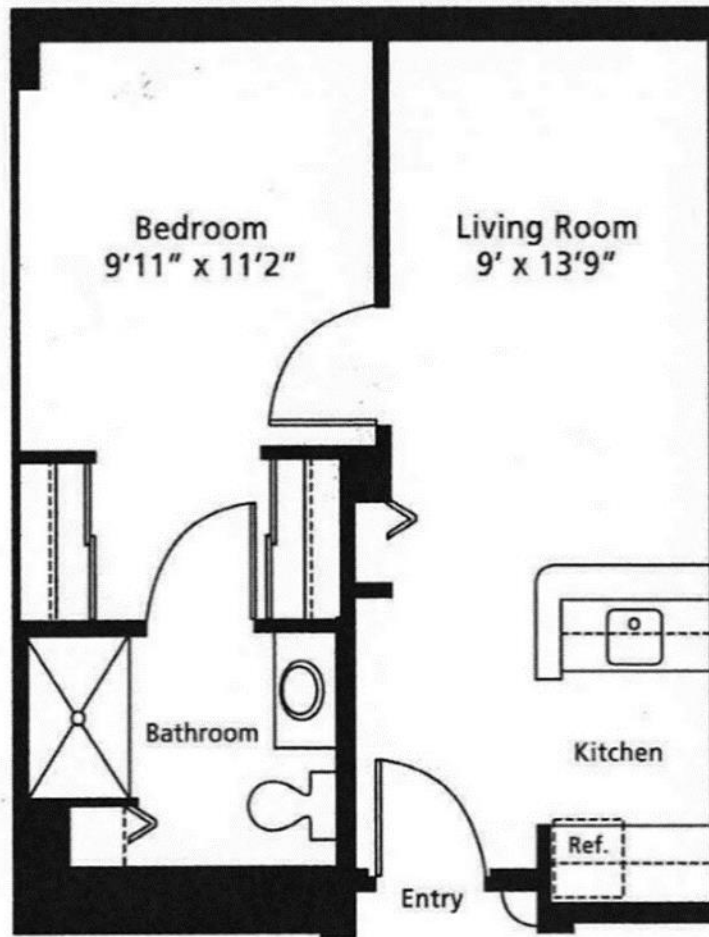


Figure 45: Kahala Nui – Hi'olani Care Center Comprehensive Nursing Semi-Private Bedroom Floor Plan.¹⁶⁷

Cost and Activities Information

Cost

Table 17: Cost of Rooms at the Kahala Nui – Hi'olani Care Center.

Assisted Living	Monthly Cost	Federal Assistance
Reservation Deposit	\$500	\$0
Security Deposit	One Month's Rent	\$0
Rental Rate		
One Bedroom Suite	\$7,212	\$0
Couples Rate	\$3,606	\$0
Studio Rate	\$6,710	\$0
Memory Care		
Reservation Deposit	\$500	\$0
Security Deposit	One Month's Rent	\$0
Private Suite	\$9,196	\$0
Comprehensive Nursing		
Reservation Deposit	\$436	\$0
Security Deposit	\$393	\$0

Source: Cost taken from Kahala Nui - Hi'olani Pamphlet.¹⁶⁸

Assisted Living

Assisted living includes recreation and wellness programs, housekeeping, linen service, meals, assistance with activities of daily living, cable, telephone service, and transportation.¹⁶⁹

Some additional services include: rehabilitation therapy services, beauty salon services, personal laundry service, the provision of medical supplies and select personal care supplies, pharmaceutical services, laboratory services, and mobile radiological services.¹⁷⁰

¹⁶⁸ Ibid.

¹⁶⁹ Ibid.

¹⁷⁰ Ibid.

Memory Care

Memory care includes recreation and wellness programs, WanderGuard system, serenity room, housekeeping, linen and personal laundry service, meals, assistance with activities of daily living, cable, and telephone service.¹⁷¹

Some additional services include: rehabilitation therapy services, beauty salon services, personal laundry service, the provision of medical supplies and select personal care supplies, pharmaceutical services, laboratory services, and mobile radiological services.¹⁷²

Comprehensive Nursing

Comprehensive nursing includes recreational and wellness programs, WanderGuard system, housekeeping, linen services, meals (Including special diets), and social services.

Some additional services include: rehabilitation therapy services, beauty salon services, personal laundry service, the provision of medical supplies and select personal care supplies, pharmaceutical services, laboratory services, and mobile radiological services.¹⁷³

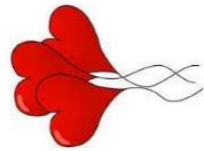
¹⁷¹ Ibid.

¹⁷² Ibid.

¹⁷³ Ibid.

Activities

Below is an example of activities the residents at the Hi'olani Care Center would experience on a monthly basis.



February 2015

Hi'olani Care Center Memory Support

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1 8:30 Tai Chi 9:30 Catholic Service 1:30 BUNCO 1:30 Super Bowl game 2:30 Movie Matinee 4:00 Bags N Buckets	2 8:45 Chair Fitness 10:00 Garden group 1:30 Giant Crossword 3:00 Sing Along 4:00 Ballooney Ball	3 8:45 Chair Fitness 10:00 Music Therapy 1:30 Craft Creations 3:00 Ring Toss 4:00 Play it Now	4 8:45 Chair Fitness 9:30 Garden Walk 10:00 Boomer's Pet visit 1:15 Hula Noho 2:30 Ice Cream Cart 3:00 Basketball	5 8:45 Chair Fitness 9:30 Trivia Fun 10:30 Songs w/Bob 1:30 Computer Class 3:00 Horse Racing	6 8:45 Chair Fitness 9:45 Bus Ride 10:00 Sing Along 1:30 Pastor Dan 2:45 Local-Style Kitchen w/Joy	7 8:30 Chair Yoga 9:30 Sing Along 1:30 Black Jack "21" 3:00 Games/ Puzzles
8 8:30 Tai Chi 9:30 Catholic Service 1:30 BUNCO 2:30 Movie Matinee 4:00 Bags N Buckets	9 8:45 Chair Fitness 10:00 Garden group 1:30 Giant Crossword 3:00 Sing Along 4:00 Ballooney Ball	10 8:45 Chair Fitness 10:00 Music Therapy 1:30 Craft Creations 3:00 Ring Toss 4:00 Play it Now	11 8:45 Chair Fitness 9:45 Garden Walk 10:30 Philip's Pet visits 1:15 Hula Noho 2:30 Ice Cream Cart 3:00 Bean Bag Toss	12 8:45 Chair Fitness 9:30 Trivia Fun 10:30 Songs w/Bob 1:30 Horse Racing 3:00 Star of the Sea School "Little Stars"	13 8:45 Chair Fitness 9:45 Bus Ride 10:00 Sing Along 1:30 Pastor Dan 2:30 Valentine's Happy Hour w/Jill Fisher	14 8:30 Chair Yoga 9:30 Sing Along 1:30 Black Jack "21" 3:00 Games/ Puzzles
15 8:30 Tai Chi 9:30 Catholic Service 1:30 BUNCO 2:30 Movie Matinee 4:00 Bags N Buckets	16 8:45 Chair Fitness 10:00 Garden group 1:30 Giant Crossword 3:00 Sing Along 4:00 Ballooney Ball	17 8:45 Chair Fitness 10:00 Music Therapy 12:00 MARDI GRAS! 1:30 Craft Creations 3:00 Ring Toss 4:00 Play it Now	18 8:45 Chair Fitness 10:00 Garden Walk 1:15 Hula Noho 2:30 Ice Cream Cart 3:00 Basketball	19 8:45 Chair Fitness 9:30 Trivia Fun 10:30 Songs w/Bob 1:30 Computer Class 3:00 Horse Racing	20 8:45 Chair Fitness 9:45 Bus Ride 10:00 Sing Along 1:30 Pastor Dan 2:45 Local-Style Kitchen w/Joy	21 8:30 Chair Yoga 9:30 Sing Along 1:30 Black Jack "21" 3:50 Chinese New Year Celebration
22 8:30 Tai Chi 9:30 Catholic Service 1:30 BUNCO 2:30 Japanese Sing Along 4:00 Movie Matinee 4:00 Bags N Buckets	23 8:45 Chair Fitness 10:00 Garden group 1:30 Giant Crossword 3:00 Sing Along 4:00 Ballooney Ball	24 8:45 Chair Fitness 10:00 Music Therapy 1:30 Craft Creations 3:00 Ring Toss 4:00 Play it Now	25 8:45 Chair Fitness 9:45 Garden Walk 10:30 KN Hula dancers 1:15 Hula Noho 2:30 Ice Cream Cart 3:00 Basketball	26 8:45 Chair Fitness 9:30 Trivia Fun 10:30 Songs w/Bob 1:30 Computer Class 3:00 Horse Racing	27 8:45 Chair Fitness 9:45 Bus Ride 10:00 Sing Along 1:30 Pastor Dan 2:45 Fresh Fruit Smoothies w/Joy	28 8:30 Chair Yoga 9:30 Sing Along 1:30 Black Jack "21" 3:00 Games/ Puzzles

Figure 46: Activities Calendar example provided by Director of Marketing and Community Outreach.¹⁷⁴

¹⁷⁴ Darlene Canto. email message to author, April 6, 2015

Typical Day in the Life of a Resident at Kahala Nui Hi'olani Care Center

Table 18: Typical Daily Schedule.¹⁷⁵

Time	Activity
6:00 AM	Wake up/morning care (brush teeth, shave/apply makeup, change clothes)
7:00 AM	Breakfast
8:30 AM	Wake up/morning care (brush teeth, shave/apply makeup, change clothes)
10:00 AM	Exercise Class or Personal one-on-one activities
12:00 PM	Lunch
1:30 PM	Group Activities
2:00 PM	Craft Class
2:30 PM	Craft Class
3:30 PM	Bingo
5:00 PM	Dinner
6:00 PM	Evening Care (bathe, brush teeth)
7:00 PM	Movie Time
8:00 PM	Sleep

¹⁷⁵ Olivia Kim. email message to author, May 28, 2015

Comparison

Below is a table of the focus variables for the care center tours. The items in the far left column were initially chosen based on this project's research. Additional architectural features were included based on observations from the site visits. The four sites were selected based on price range and facility size, to reflect the wide range of options available on Oahu. Even though the two Plazas are the same company, they were chosen based on each one's different design features making them unique enough to stand out from each other.

Table 19: Comparison of Variables between Case Studies.

	Manoa Cottage in Kaimuki	The Plaza – Moanalua	The Plaza – Mililani	Hi'olani Care Center
Site				
Vegetation	X	X	X	X
Place to Wander	X	X	X	X
Parking	X	X	X	X
Exterior Security	X	X	X	X
Outdoor Furniture	X	X		X
Security Camera				X
General Area				
Hardwood Flooring	X			
Carpet		X	X	
Stone				X
Natural Lighting	X	X	X	X
Natural Air	X	X	X	X
Non-skid Floor	X	X	X	X
Windows	X	X	X	X
Efficient Light Fixtures	X	X	X	X
Railings	X	X	X	X
Handrails	X	X	X	X

	Manoa Cottage in Kaimuki	The Plaza – Moanalua	The Plaza – Mililani	Hi’olani Care Center
Plants	X	X	X	X
Place to Pace	X	X	X	X
Lower Ceilings	X		X	X
Bedrooms				
Personal Identification	X	X	X	X
Differentiating wall colors	X	X	X	
Signage	X	X	X	X
Personal shadowboxes	X	X	X	
Ability to Personalize	X	X	X	X
Vinyl Flooring	X	X	X	X
Windows	X	X	X	X
Security Cameras				X
Furniture	X	X	X	X
Overall Homelike Feel	X	X	X	
Safety/Security				
Bed monitors				X
Secured Exit Doors	X	X	X	X
Secured Elevator	X	X	X	X
Acoustics	X	X	X	X
Corridors				
Signage	X	X	X	X
Handrails	X	X	X	X
Hardwood Floors	X	X	X	X
Differentiating wall colors	X	X	X	X
Place to Pace	X	X	X	
Activity				
Exercise	X	X	X	X
Namaste Care	X			

	Manoa Cottage in Kaimuki	The Plaza – Moanalua	The Plaza – Mililani	Hi’olani Care Center
Art Class	X	X	X	X
Gardening	X	X	X	X
Pet Therapy		X	X	X

Among the author’s overall first impressions on entering the care facilities were feelings of relaxation, comfort, aging with dignity, and either a home- or a hotel-like feel. Although three of the four facilities offered assisted living and memory care and the fourth could accommodate residents suffering from advanced dementia, the author felt as if he had entered a private hotel for older adults in each of these facilities.

The entryway of the Manoa Cottages in Kaimuki exudes a warmth that is more like a person’s large home than a care facility. Just inside the front entry, there is a foyer with a view of the kitchen and the receptionist. The lower ceilings, neutral color palette, sliding windows, and resident artwork give off the more inviting feelings of home. A possible negative aspect of Manoa Cottages is that due to lot restrictions, gardening is limited to a small portion of land in the front by the parking lot and a small concrete patio in the back of the facility. The concrete flooring and chain-link fence around the gardening area may come across as sterile and restrictive to the residents.

The author’s overall critique of Manoa Cottages in Kaimuki is good for the following reasons:

- The design approach, the renovation of an existing structure to meet the needs of older adults with advanced cases of dementia, was unorthodox and interesting.
- The feeling of the facility was home-like and warm.

By taking the values and beliefs of their original care facility (Manoa Cottages) and building them into this new state-of-the-art facility, Manoa Cottages in Kaimuki truly connects with their residents on a multitude of care levels.

When visiting the Plaza at Moanalua, the first thing that stands out is the exterior façade. From the window styles, to the color palette, to the vertical lattices on the exterior walls, the building's façade gives off the impression of a giant house. The same visual experience can be said of the Plaza at Mililani. The noticeable difference between the two Plazas is the size. The Plaza at Mililani, due to lot restrictions, looks like a much-scaled down version of the Plaza at Moanalua. The Plaza at Mililani has a porte-cochère, a covered entrance large enough for vehicles to pass under, which offers the families and residents a clear point of entry, unlike the Plaza at Moanalua, whose entrance is distinguished only by a different colored wall with an automated sliding door. The lower ceilings at the Plaza at Mililani give the sense of a home whereas the higher ceilings at the Plaza at Moanalua give the sense of a hotel.

Because the same architecture firm designed both of these Plazas, the overall design did not vary much between them. Both facilities offered an outdoor area to pace. The Plaza at Mililani could not offer the same outdoor walkway as the Plaza at Moanalua because of lot restrictions; the area for residents to pace was isolated to an area on the second floor, above a waterfall.

One of the standout technological features the Plazas offer is an integrated communication system in both the bedrooms and shower rooms. With this system, staff members can be immediately alerted when a resident pulls the help cord. Smoke detectors are also integrated in the system.

The author's overall critique of the two Plazas is good because the design is clearly centered on both the physical and emotional care and wellbeing of the residents. By addressing up front many of the issues that could potentially become problems, the Plazas' design offers room for adaptability and change.

The last facility the author visited was the Kahala Nui - Hi'olani Care Center. From the moment the author parked his car, it was evident that this facility truly cares for its residents. From the manicured lawns, to the porte-

cochère, to the waterfall at the entrance, to the giant lobby, Kahala Nui offers a warm, safe welcome.

From the entryway, this facility appears to cater more to the independent and assisted living residents than the residents on the memory care floor. The main lobby is no different from that of a hotel, and the author noticed a distinct lack of the sense and warmth of home.

Because Kahala Nui offers aging-in-place elements and many of the residents enter at a younger age, design features usually found in an SNF are not located on the lower levels. As a resident ages, he or she has the opportunity to age in place. Many of the amenities, costs, and fees change as a resident ages and needs change. According to the administrator, if a resident chooses to age in place in his or her current room, a separate charge is added.

Kahala Nui is a facility that is slowly integrating technology into all daily activities. By having a computer in every corridor with each resident's background and status, nurses can meet the needs of the residents quickly and efficiently.

Security at Kahala Nui is as high a priority as security at the Plazas. All stairwell doors and elevators are disguised to look like any other room on the floor. When a family or friend visits a loved one on the memory care floor, a nurse or staff member will escort the visitor. Only with permission from the nurse or staff member can a resident with dementia leave that floor. At the Plazas, the same measures are practiced. However, at the Plazas, unlike at Kahala Nui, residents with dementia are allowed to wander around the floor without supervision. At Manoa Cottages in Kaimuki, security implementations are in place but because the facility only has two floors and the residents only move between floors for Namaste therapy, the security features are not as extensive as those of the other facilities.

The author's overall critique of Kahala Nui is: "You get what you pay for." Kahala Nui is probably one of the most expensive care facilities in Hawai'i, but not without reason. The overall design of the care facility is excellent. The architects and owners clearly understood the needs of both the residents and

staff. Despite the lack of a feeling of home, nowhere in the facility did it feel too sterile for residents. The dining area felt like a giant restaurant with a great view. The corridors felt a little too much like a hotel; nowhere was there an indication of room personalization or any sort of personal decorations. There was no noticeable resident artwork anywhere in the facility to help create the feeling of home. Also, the floors are carpeted in a similar manner to a hotel. Even with the constant and careful upkeep, the carpets showed signs of heavy traffic.

The different architectural components that were used to compare the four different case studies are based on the research conducted for this project. The goal was to understand where Hawai'i stands as far as creating environments for its aging population. Architecturally, Hawai'i is taking the right steps and initiative toward improving the quality of care at care facilities. Although each of these four facilities is designed based solely on what the owners feel is important, none is documented in a way that can offer guidance to others.

Summary of Part 1

The journey that led the author to this project was both bumpy and interesting. Finding a topic that was relevant, unique, and relatively uncharted was a challenge. Originally, the project was set to focus on improving the current living conditions in SNFs in Hawai'i. However, after conducting initial research, the author identified a gap, a puzzle piece missing in the design of care facilities: the design of Dementia Care Facilities. Many facilities offer dementia care in Hawai'i, but the State has not established standards for defining or ensuring a basic level of care. The Hawai'i Revised Statutes (HRS) Chapter 94 lays out the State's minimum requirements for building SNFs. However, neither this HRS chapter nor any other mentions dementia care in any way.

As explained in the introduction, the population of older adults with dementia is growing rapidly. Guidelines should be in place to help mitigate and regulate how facilities build and care for older adults with dementia. Obviously these guidelines would specifically pertain to SNFs, but should also be applicable to the other care facility types on a case-by-case basis.

While conducting the research on Alzheimer's disease, the author realized that for a person who is not familiar with dementia, as many are not when their loved ones are first diagnosed, understanding the disease and identifying how and where to get help can be a confusing and overwhelming process. In this case, as well as for this project's research, the Alzheimer's Association is an invaluable resource and guide.

The first part of this dissertation offers information to architects, designers, and even family members about the disease, its progression, what to expect, and how to cope. The second part, along with the Design Project, presents design guidelines and facility features and amenities that should be included in a dementia care environment.

Much research has been conducted in the field of Alzheimer's disease and dementia, and even though there is no cure in sight, doctors, scientists, gerontologists, care facility administrators, and designers and architects in the field are constantly pursuing new information and technology to help improve the environments in which older adults live. Hawai'i has the opportunity to establish a set of guidelines that addresses the different care issues bound with Alzheimer's disease and dementia. As previously mentioned, Part 2 presents and discusses guidelines formulated specifically for the state of Hawai'i that address the needs of older adults with Alzheimer's disease and dementia in a care facility setting.

California has implemented statewide guidelines to ensure that all care facilities provide a basic level of proper care. Moving forward, it is important for Hawai'i to do likewise, to provide architects and designers of care facilities proven design methods to ensure that the specific needs and safety of the residents are met with comfort and dignity. However, Hawai'i state legislators seem to be dragging their feet, disregarding the importance of providing standards for the development of future care facilities. Hawai'i is known for implementing changes that can essentially better the lives of its residents at a markedly slower pace than other places. Politics, money, and other barriers prevent continuity between the legislators and the residents.

Part 2 of this dissertation is a showcase of the kind of guidelines the State needs to establish as soon as possible. The following chapters provide the critical design information necessary to create a facility in Hawai'i that is appropriate for older adults with Alzheimer's disease and dementia. The design considerations are, at this point in time, a complete set. The reason the author mentions time is that the continuing research on Alzheimer's disease and dementia may uncover, at any point, new information; new design theories are continuously being tested by gerontologists across the country.

The ultimate reason the author chose to identify guidelines for designing Dementia Care Facilities is because he hopes to help other families avoid the traumatic experience he and his family had of sending a loved one to an institution to die. The SNF that his grandfather stayed in provided subpar living

conditions, which is unacceptable and was harmful to his grandfather in the final period of his life. No family should doubt that their loved one is being cared for. These guidelines, if implemented, can return the dignity, respect, and safety that are missing in some facilities today. They can help soften the institutional aspects of a facility, replacing these with a warmer, homelike approach where needs, safety, and security are all properly met.

Part 2: Design Consideration

Introduction to Part 2

Part 2 presents design guidelines for building Dementia Care Facilities in Hawai'i. It is divided into four principal sections: Homelike Integration, Exterior Guidelines, Sensory Environment, and Interior Guidelines. Each of these is further divided into subsections presenting the design considerations most central to building for dementia care. Each subsection includes an introduction and a list of guidelines, with figures to help clarify certain points.

The first section defines homelike integration and focuses on the different key components that can create a homelike atmosphere in a facility while still ensuring the security and safety that is necessary and mandated by law.

The second section focuses on exterior guidelines. Architects and designers typically design buildings from the outside in. In this case, the building process starts with the neighborhood and moves inward.

The third section focuses on the sensory environment. This covers the human senses that are engaged on a daily basis in the facility, including acoustics, vision, and thermal comfort. Each of these represents central aspects that affect quality of life for Dementia Care Facility residents.

The final section focuses on interior guidelines, and includes wayfinding, spatial layout, interior security, window performance, door specifications, and daylighting. Interior guidelines help create spaces that are serene and minimize unnecessary agitation for residents.

The guidelines move the architect or designer from the outside to the inside, from the broad to the specific, from the street to the bedroom. Starting with the exterior provides an overall view of the program before bringing the focus in to the interior design of the building and the smaller, key detail items such as faucets, door handles, and paint scheme, ensuring that all key aspects are addressed along the way.

The following guidelines, if implemented, will help improve the architectural environment for residents living in Dementia Care Facilities. Even

so, nothing can replace interactions with actual nurses and staff. Each facility should have adequate, properly trained staff to meet the needs of its residents. Appendix C outlines each state's SNF staffing and training requirements.

Homelike Integration

Introduction

Homelike integration is an important aspect of the design of Dementia Care Facilities. Homelike integration helps soften the institutional feeling that often exists in such facilities. When one thinks of a homelike feeling, the image might involve warm colors on walls and furniture, the sounds of nature coming through open windows, and memories hanging on walls. Homelike integration provides an environment that supports both the physical and mental aspects of residents' well-being and also helps with the transitioning process for many older adults and their families.

Although Dementia Care Facilities fall under the SNF umbrella, the scale and scope of these facilities are far different. To incorporate a homelike feeling into a Dementia Care Facility, different design drivers must direct the decisions needed to create a successful facility.

Homelike integration is an integral part of designing a Dementia Care Facility because its goal is to offer a tangible sense of warmth and care that older adults can relate to when transitioning from their homes to the facility. Homelike integration identifies the features that create a sense of home and translates them for a care facility setting. Homelike integration also provides a way to filter the types of design considerations that are applicable to the development of future facilities.

Homelike integration will differ, in certain aspects, from state to state. Thus, many of the design considerations for this project's guidelines are inspired by elements found in and around a typical home in Hawai'i. However, many of the design considerations will apply to multiple states.

The following guidelines were designed for future development as well as updates to existing facilities

Philosophy of Care

Introduction

A facility's philosophy of care should be integrated into its mission statement. A philosophy of care can help guide a facility, ensuring that it provides the right amount and quality of care for each resident. The goal of this declaration is to provide direction to designers and architects in the creation a physical environment that ensures the safety and security of the residents, supports their functional abilities, assists them with wayfinding, reduces agitation, facilitates communal interaction, supports mental stimulation, and facilitates integration with families. The following list, taken from Elizabeth Brawley's book, *Designing for Alzheimer's Disease*, identifies important goals to include in a philosophy of care to ensure that the dignity of the residents remains intact¹⁷⁶:

1. **Mission statement:** The mission statement should be dedicated to continuous care and support of the older adult with dementia.
2. **Pre-Admission:** Focus should be placed on understanding the type of dementia the older adult has as well as any patterns that differ from normal aging and may cause disturbances among other residents.
3. **Admission:** The resident should be given sufficient time to adjust or acclimate to their new environment. During this transitional period, families and friends should be encouraged to support the transition by visiting on a daily basis.
4. **Care Plan:** A flexible care plan should be coordinated with the resident's personal physician that will accommodate the resident's specific needs to minimize agitation and discomfort.
5. **Living Conditions:** A flexible program should be in place that can meet the resident's changing needs as the dementia worsens, whether this is increased security or additional nursing services.

¹⁷⁶ Brawley, Elizabeth C. 1997. *Designing for Alzheimer's Disease*. New York: John Wiley & Sons, Inc. 44-45.

- 6. Staff Training:** All staff members, including nurses, administration, and non-direct staff, should be trained on how to approach and communicate with residents with dementia. A specific focus of the training should be on how to avoid, both verbally and physically, subtle belittling of the residents or treating them like helpless children; each resident should, at all times, be treated with basic human dignity. Also, continuous training on dementia should be required, as the symptoms of dementia constantly change.
- 7. Physical Environment:** The following sections lay out design features that should be implemented in order to properly support the population of residents with dementia.
- 8. Family Interaction:** Family interaction is the key to having a successful transition from home care to facility care. Family members should be a part of the transition process as well as the acclimation process into their new environment. Dementia care facilities should be open to any questions that family members may have regarding their loved ones staying at their facility.

Entry

Introduction

In any home, nothing sets the mood of home like the entry. The entry area should house the reception hall and be the place where the family is greeted. This area is where family, potential residents, and visitors form their first impressions of the facility. The entry's sensory environment plays a significant role in whether a family will choose the facility or not.

Guidelines

- In the entry area, showcase *why* the facility exists, *who* the facility's staff and residents are, and *what* beliefs the facility represents.
- The entryway should not feel crowded or cramped but rather open, free-flowing, and safe.
- The entry should emanate the warmth of a home; the staff should present a friendly environment; and most importantly, the space should have a welcoming spirit. In Hawai'i there is a certain "Aloha" or welcoming feeling you get when entering a new environment (see figure 47).
- The entry should have a large opening that leads the residents, families, and visitors to either the heart of the facility or another significant feature. A good example of this is Kahala Nui: the lobby showcases an open courtyard that has both outdoor seating and a water feature (see figure 48).



Figure 47: Kahala Nui's lobby offers a good sense of the Aloha Spirit that many local residents recognize.¹⁷⁷

¹⁷⁷ Gigi-Hawaii. 2008. Thoughts for Monday. July 21. Accessed February 20, 2016. <https://gigihawaii.wordpress.com/2008/07/page/2/>.



Figure 48: At the end of the entry, there is an outdoor seating area that connects the exterior with the interior. The lobby at Kahala Nui also is naturally ventilated, another aspect of life with which many residents in Hawai'i are accustomed.¹⁷⁸

¹⁷⁸ Architects Hawai'i Ltd. 2014. Kahala Nui Senior Living Community. Accessed February 20, 2016. <http://www.ahldesign.com/projects/kahala-nui-senior-living-community/>.

Living Room

Introduction

The living room is the room in which, on average, residents spend the second greatest length of time during a day, after the bedroom. The living room is often a place full of life and energy. The right balance and layout of furniture is important—too much furniture can make the room cluttered and difficult to maneuver while rooms with too much open space are often difficult for residents to compute and can become overwhelming. The right amount and layout of furniture in a larger room can help break up the space into smaller, more intimate and manageable areas for residents.

Guidelines

- The living room should be a node in the building that leads to other parts of the building.
- Ensure the paths leading to other parts of the building are distinguished and clear.
- It is important to remember when designing the living room that it is an important node, but not the primary node around which everything revolves.
- Use furniture to break down a large room into smaller zones in which residents can engage (see figure 49).



Figure 49: Furniture can help create smaller zones within a larger zone.¹⁷⁹

¹⁷⁹ St. Peter's Healthcare. (2016, February 1). Photo Gallery. Retrieved from https://www.nehealth.com/senior_services/Nursing_Homes/Eddy_Village_Green_at_Beverwyck/Photo_Gallery/

Dining Room

Introduction

The dining room in a Dementia Care Facility is significant because it is a place where all of the senses can be simultaneously stimulated. It is the most central place in a facility because it is generally the most frequently visited room during the day. It is also the room where the most socialization and personal interaction takes place.

Guidelines

- The dining room should be a simple and attractive space that is a size and scale older adults can compute and should not resemble a cafeteria.
- Tables in the dining room should seat no more than four.
- An ideal table size is 50 inches by 50 inches.
- Set the dining room near the kitchen so that travel between the kitchen and dining area is short for staff members.
- Install photodetectors or photo sensors to maintain the brightness of the room.
- The minimum light level in a dining area should be 50 foot-candles.
- Incorporate reds and yellows, which can encourage eating; avoid yellow-greens and blues, which can discourage eating (see figure 50).¹⁸⁰
- Keep patterns in the room, such as those on the tablecloths, simple.
- When choosing furniture and its layout, provide enough space to ensure that all parts of the room are wheelchair-accessible.

¹⁸⁰ Brawley, Elizabeth C. 1997. *Designing for Alzheimer's Disease*. New York: John Wiley & Sons, Inc. 167.

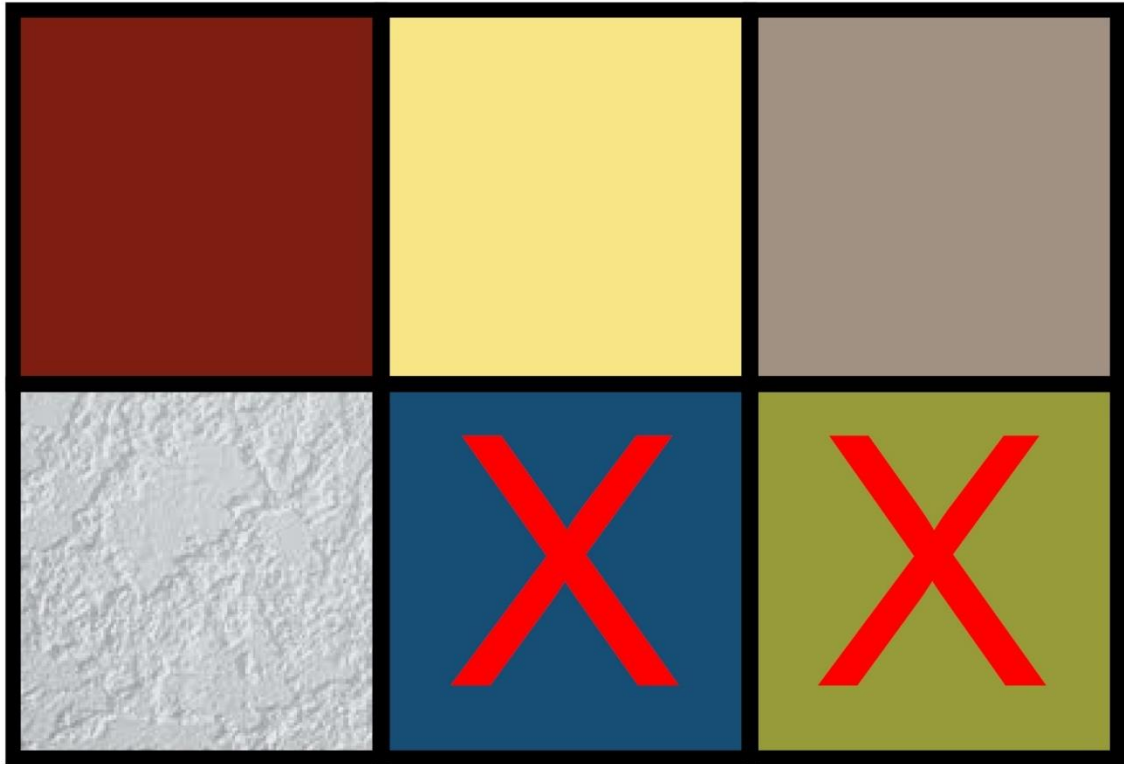


Figure 50: Examples of good and poor color choices for the dining room. Blue and green are not recommended in the dining room because they may discourage eating.

Source: Author

Kitchen

Introduction

The kitchen is by far the most important space in a Dementia Care Facility. The kitchen is a familiar place to most residents, a place where, like the dining room, many senses, including sight, sound, smell, and touch, can be stimulated at once. Working and spending time in the kitchen can help residents feel like they are living in a care home rather than an institution.

Guidelines

- The kitchen is the most important room in a Dementia Care Facility. Kitchens are familiar to most residents, can stimulate many senses at once, and can provide a feeling of living in a care home rather than in an institution.
- Many of the items in the kitchen are potentially dangerous. Glassware, knives, sharp utensils, and other such items should be closely monitored when residents are helping in the kitchen.
- Install induction stoves for use in the kitchen. Induction stoves are safer and more efficient than traditional stoves and ranges.
- Ensure that the kitchen design can accommodate residents who are handicapped.
- Kitchen sinks should conform to the 2010 ADAAG standards for accessibility.
- Set the upper wall cabinets low enough that a person in a wheelchair can access the items within.
- If residents will only be assisting the sous chef, then the main design features to incorporate involve designating enough floor space for maneuverability and under-cabinet space for wheelchairs (see figure 51).
- Design the layout to provide a homelike feeling yet still be a complete and functional kitchen for staff members.

- Use direct lighting over areas where prepping and cooking will occur.
- Determine kitchen acoustics based on the room's layout.
- Use type X Gypsum wallboard on the walls and ceiling.



Figure 51: A typical kitchen layout that offers a homelike feeling yet still functions as a full kitchen for staff members.

Source: Author

Bedroom

Introduction

Of all the rooms in a Dementia Care Facility, the bedroom requires the most flexibility. Because residents spend the greatest amount of the day in this part of the facility, they should be able to modify their surroundings to a certain extent to create their own personal feeling of home. The bedroom should provide the safety and security that residents need, but shouldn't feel institutional with, for example, whitewashed walls and cameras watching from above. To minimize agitation, the facility should provide a bed and storage spaces and then allow the family to design the room to resemble the resident's room at home as closely as possible (see figure 52 for typical bedroom layouts).

Guidelines

- Choose a homelike palette and texture for bedroom walls (see figure 53).
- Ideally, around 220 square feet should be allotted per resident for personal space and belongings.
- The bedroom space should also be able to accommodate machines such as ventilators, tracheostomy tubes, tube feeders, and wheelchairs.
- Allow residents to bring in some small items of furniture and other belongings from their homes.
- Provide sufficient storage space within each resident's room.
- If throw rugs are an option, ensure that the floors provide enough resistance to prevent rug slippage.
- Each bedroom should have an accessible, useable window, either sliding or hung. Also, safety measures should be established to prevent residents from climbing up or falling out of the windows. See the Windows section for more information.

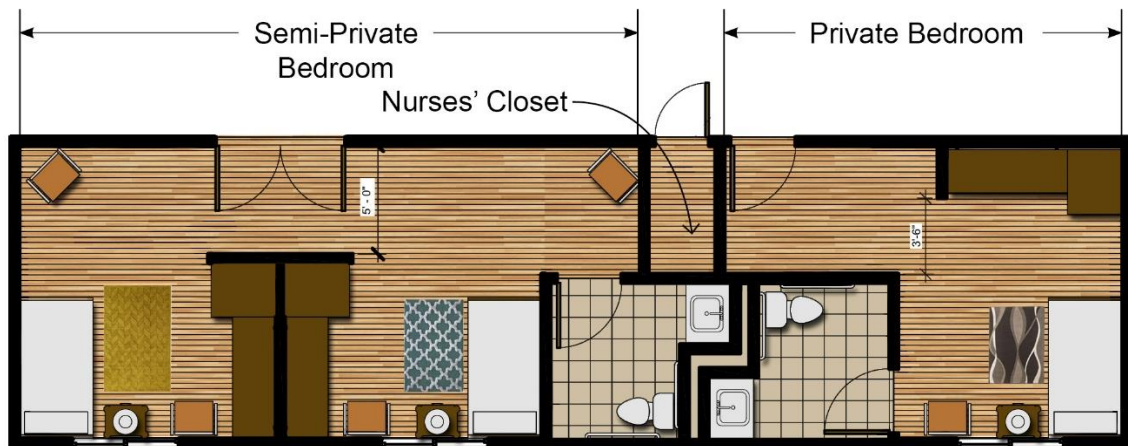


Figure 52: A typical layout for a semi-private bedroom (left) and a private bedroom (right). The bedroom should resemble the resident's own bedroom. For semi-private bedrooms, strategically placing cabinets and dressers can help divide the space and create a greater sense of privacy.

Source: Author

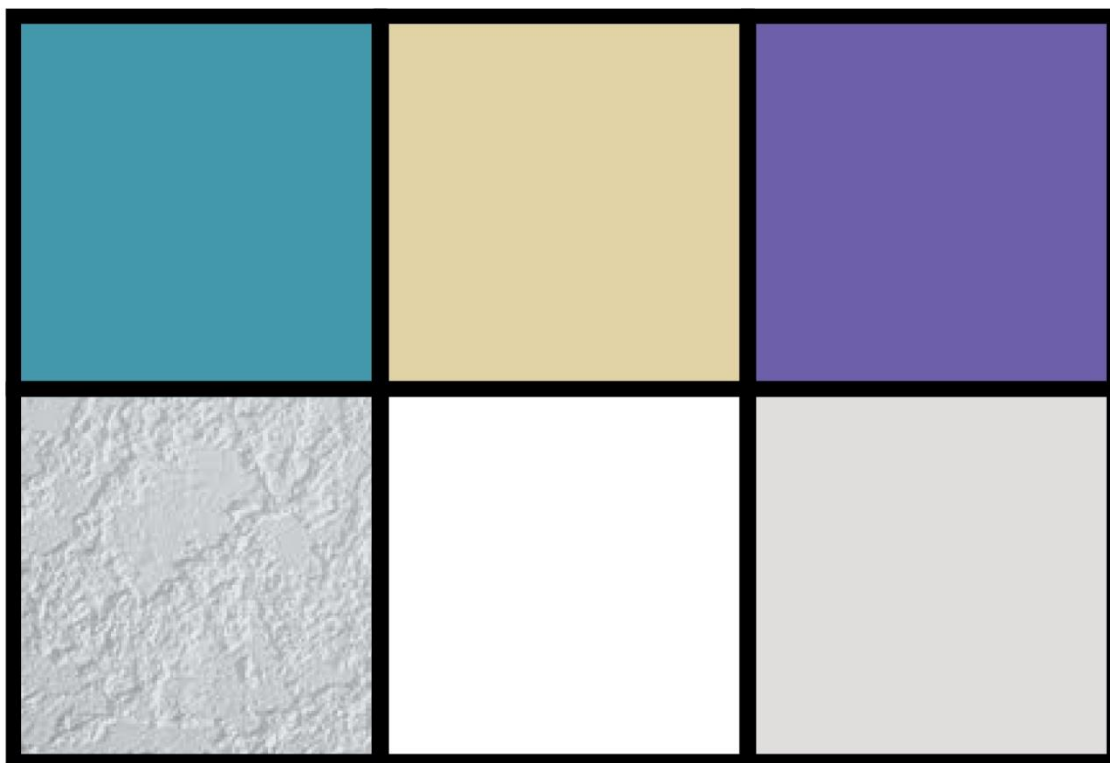


Figure 53: Examples of different colors and textures for the bedroom. The color palette above shows typical colors of bedroom walls from case study site visits.

Source: Author

Restroom

Introduction

Restrooms are the areas in Dementia Care Facilities where the most accidents occur. With proper design guidelines in place, however, many accidents, such as falls from poor lighting or slippery floors, can be prevented.

Guidelines

- The transition into the restroom and shower room should be seamless. If there is a transitional sill, it must not exceed a quarter of an inch for wheelchair access.
- ADAAG requires that restroom and shower room doors have a minimum opening of 36 inches. A 42-inch opening, however, is more suitable and comfortable.
- Countertops should be 34 inches tall for wheelchair access.
- Install countertops and faucets with a matte-finish. Satin, nickel, and bronze are also acceptable choices; chrome is not acceptable (see figure 54).
- Contrast countertop materials with the walls.
- Ensure that water temperature is regulated and not able to exceed 110 degrees Fahrenheit.
- Design a 5-foot turn-around space inside the restroom to provide wheelchair maneuverability (see figure 55).
- Install at least two Ground Fault Circuit Interrupters (GFCI) no higher than 48 inches from the finished floor in each restroom and shower room.
- Toilets or water closets should be no taller than 18 inches (see figure 56 for grab bar heights and placement).
- Allocate a maximum of six residents per restroom and twelve per shower room.



Figure 54: Faucets 1¹⁸¹, 2¹⁸², and 3¹⁸³ are appropriate for a Dementia Care Facility because the handles are arthritis-friendly; faucets 4¹⁸⁴, 5¹⁸⁵, and 6¹⁸⁶ are not. Faucets should not have chrome finish as it may create glare.

¹⁸¹ American Standard. 2016. Dazzle 2 handle 4 Inch Centerset High-Arc Bathroom Faucet. Accessed February 18, 2016. <http://www.americanstandard-us.com/bathroom-faucets/dazzle-two-handle-centerset-bathroom-faucet/>.

¹⁸² Wayfair. 2016. Cross Handle Bathroom Faucets. Accessed February 18, 2016. <http://www.wayfair.com/Bathroom-Faucets-l655-c215775-O5020~Cross+Handles.html>.

¹⁸³ Aralik. 2013. Home Design And Decoration. Accessed February 18, 2016. <http://besthomedeco.blogspot.com/2013/12/inside-decorating-kinds-that-can-use.html>.

¹⁸⁴ Home Renovation and Repairing. 2015. How RV Bathroom Faucets Can Make Your Bathroom Look Even More Attractive? August 15. Accessed February 18, 2016. <http://homerennovation.tumblr.com/>.

¹⁸⁵ Wayfair. 2016. Vessel Bathroom Faucets. Accessed February 18, 2016. <http://www.wayfair.com/Bathroom-Faucets-l655-c215775-O5141~Vessel+Faucets.html>.

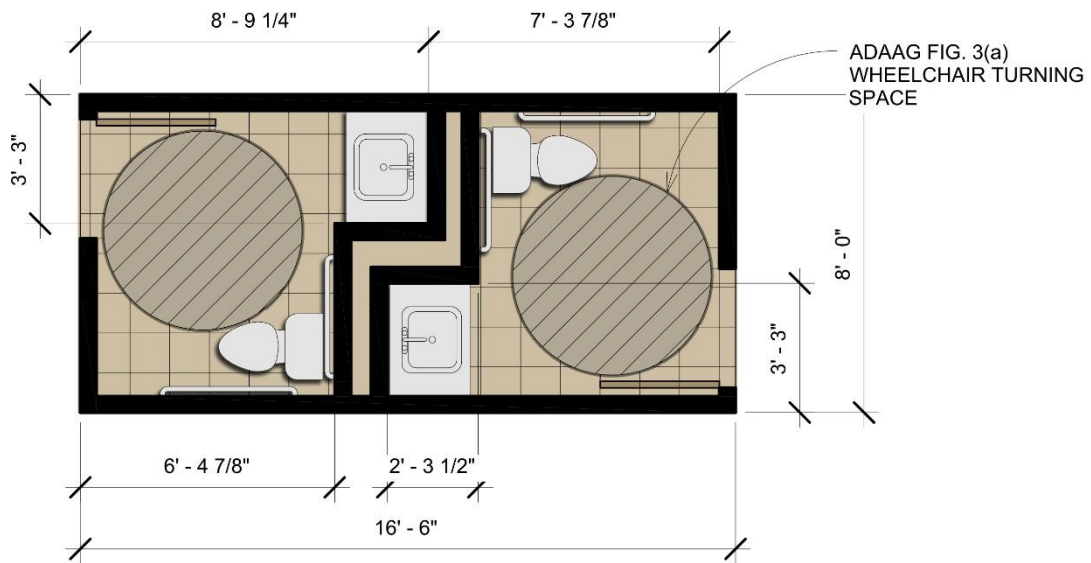


Figure 55: Ideal restroom layout that reduces space while maintaining a 5-foot radius for a wheelchair to turn

Source: Author

¹⁸⁶ Flashconf. 2016. Moen Chateau In Centerset Single Handle Low Arc Bathroom Faucet Moen Bathroom Sink Faucets. February 1. Accessed February 18, 2016. <http://flashconf.com/2016/02/01/moen-chateau-in-centerset-single-handle-low-arc-bathroom-faucet-moen-bathroom-sink-faucets/>.

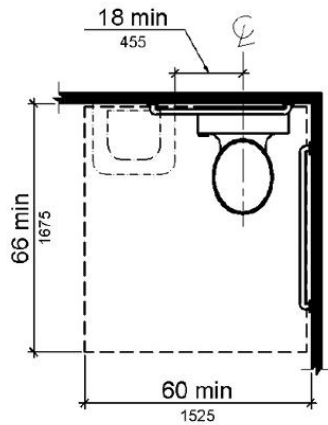


Figure 604.3.2 (Exception)
Overlap of Water Closet Clearance in
Residential Dwelling Units

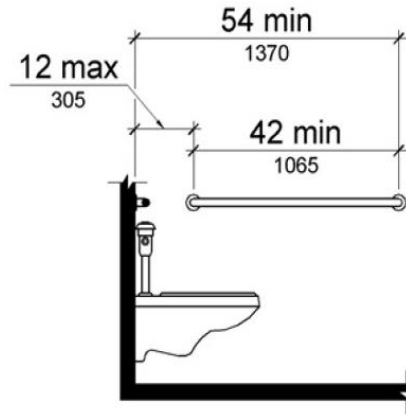


Figure 604.5.1
Side Wall Grab Bar at Water Closet

Figure 55: Location of the grab bars in a restroom.¹⁸⁷

¹⁸⁷ Department of Justice. 2010. 2010 ADA Standards for Accessible Design. Washington D.C.: ADA. 162-163.

Shower room

Introduction

Like the restroom, a greater-than-average number of accidents occur in the shower room of a Dementia Care Facility. It is also a place in which confusion, agitation, and aggression can be easily triggered, depending on the resident and the circumstances. Architects and designers must ensure that the environment they create is both aesthetically pleasing and safe. Architecturally, the environment should be spacious and welcoming, not institutional. The overall environment should be similar to that of the restroom.

Guidelines

- The shower room dimensions should be roughly 10 feet by 10 feet. This provides enough space for nurses to maneuver residents who may be wheelchair bound in the shower stall (see figures 57 and 58).
- The doorway should be at least 36 inches wide.
- Ensure that each shower room in the facility has a walk-in tub as well as a curb-less shower pan. Ideally, the entire shower room floor is the shower pan that gently slopes toward a central drain.
- The shower room should provide options to residents: walk-in tubs allow residents to bathe on their own terms.
- Place grab bars in strategic locations mainly around the inside and outside walls of the shower (see figure 56).
- Ensure that water temperature is regulated and not able to exceed 110 degrees Fahrenheit.
- Place a built-in or collapsible shower chair inside the shower. A shower chair can also be used in the bath.
- The showerhead should be adjustable. Residents may have varied preferences for the height of the showerhead. Newer adjustable showerheads also come with a grab bar.

- Slip resistant flooring material should be used in the shower room. Ceramic tiles or smooth quarry tiles are acceptable as long as they provide a gritty surface that is slip resistant.
- The walls and floor should not be the same material and should contrast with each other.
- Indirect lighting should be used in the shower room to help minimize glare from the water on the floor or in the tub.

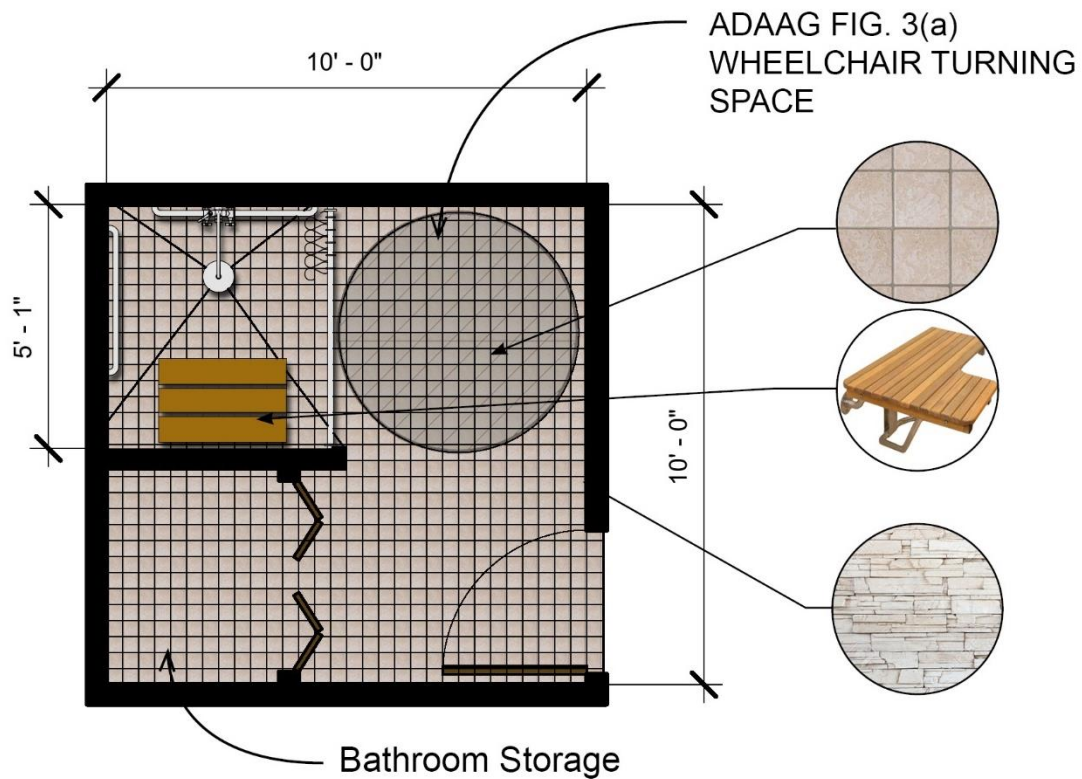


Figure 56: The first shower room option is the shower pan option where the entire room is a shower. The floors are finished with a material that is slip resistant and contrasts with the wall colors and textures. Also, the shower includes a collapsible bench for residents to use while showering.

Source: Author

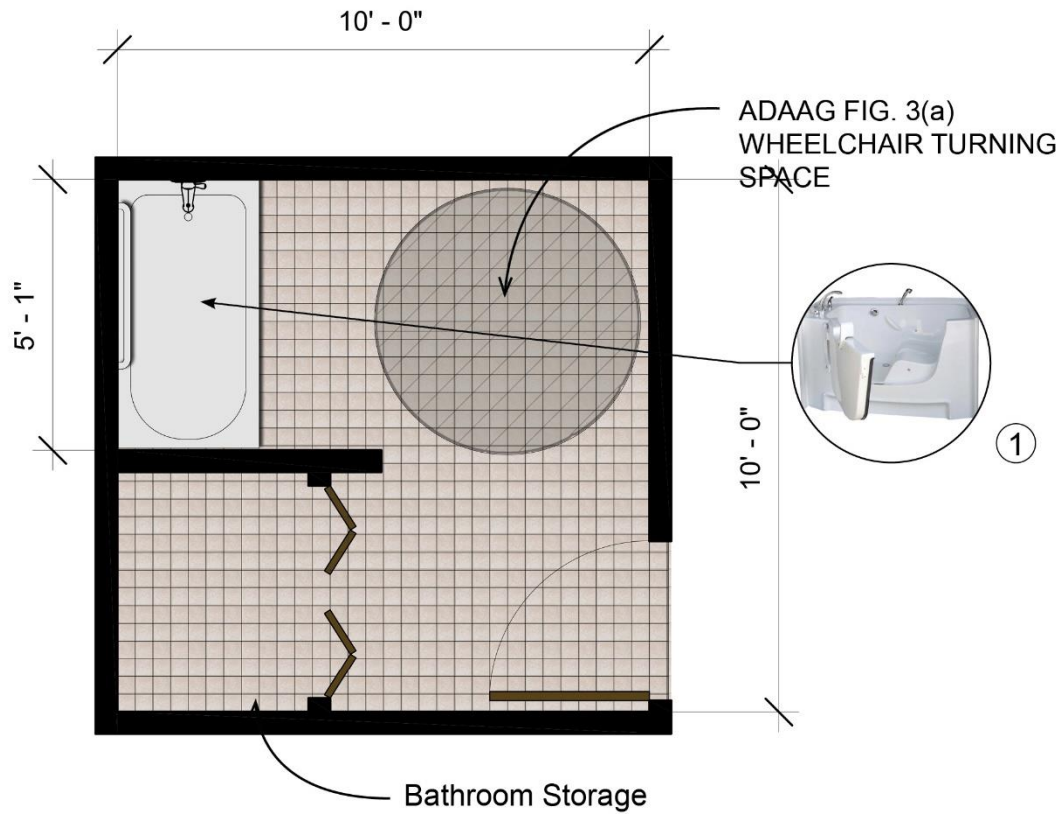


Figure 57: The second shower room option is the walk-in tub option. Walk-in tubs can provide extra comfort and security for residents suffering from Alzheimer's disease.¹⁸⁸

Source: Author

¹⁸⁸ Tangewood. 2016. Walk In Bathtub For Comfort and Safety. Accessed February 20, 2016. <http://www.tanglewoodhealth.com/index.php?page=Walk-In-Bathtub>.

Therapeutic Room

Introduction

Therapeutic rooms are an advisable addition to all Dementia Care Facilities. They offer a non-drug approach to dementia care. Therapeutic rooms, although not typically found in residential homes, can provide a safe and calming environment for residents who feel stress or anxiety. The environment usually consists of a room that can stimulate multiple senses with minimal effort from the resident.

Guidelines

- The Namaste room at the Manoa Cottages in Kaimuki has purple walls, which helps create a calming environment. Use calm colors, such as different shades of purple, for therapeutic rooms (see figure 59).
- Install wall-mounted flat screen monitors in the room that play looped videos of calming sensory scenes.
- The furniture in the room should consist of reclining massage chairs.
- The temperature in the room should be between 70 and 75 degrees Fahrenheit.
- Keep the acoustical decibel level between 30 and 45 decibels.
- Use indirect lighting with a dimmer switch.
- Use the room's dimensions to create a sense of intimacy rather than spaciousness. However, ensure the room is large enough to accommodate at least two reclining massage chairs.
- One possible location for therapeutic rooms, depending on the floor plan, is near the end of hallways to provide wandering residents with a destination point.
- Incorporate essential oil diffusers with calming scents such as lavender and chamomile.

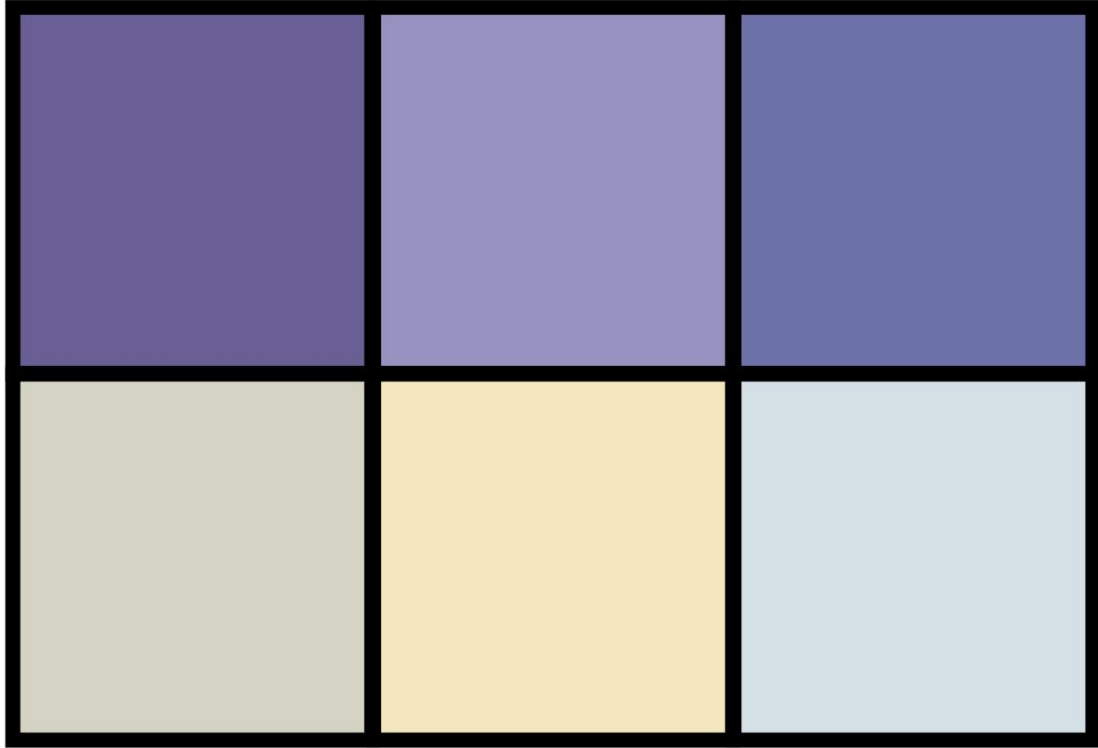


Figure 58: Color palette for the therapeutic room. This color palette is similar to that found in the Namaste Care room at Manoa Cottages in Kaimuki.

Source: Author

Integration with Other Amenities

Introduction

In a Dementia Care Facility different types of amenities are available to residents. Some can be purchased à la carte, such as television or telephone. Incorporating other types of amenities into a facility can help diminish the overall institutional feel. The Hi'olani Care Center and the numerous Plaza Assisted Living, for example, offer amenities such as beauty salons, exercise rooms, theatres, and coffee bars. These help create the feeling of an exclusive club rather than a nursing facility.

Guideline

- Provide a space that allows family members to spend a night with loved ones. This room should be similar in size to a hotel room.
- The beauty salon should be roughly 450 to 600 square feet and have space for 3 stylists.
- Due to federal regulations and the possible dangers of allowing residents to leave a facility to shop, incorporate a small shopping venue in the facility. The store should be similar to one you would find in a mall or shopping complex.
- Keep the mini store simple with a minimal amount of items and choices. Too many items may cause confusion, anxiety, or agitation.
- The store should be roughly 700 to 850 square feet. This allows for shelving as well as adequate space for wheelchair maneuverability.
- Incorporate a media stand or rack in a central place in the facility to give residents access to magazines and newspapers. This can be as simple as a niche in the wall with horizontal bars for newspapers and a table set aside for magazines (see figure 60). Set aside a medical room for visits from dentists or personal physicians.
- The medical room should be roughly 100 square feet.

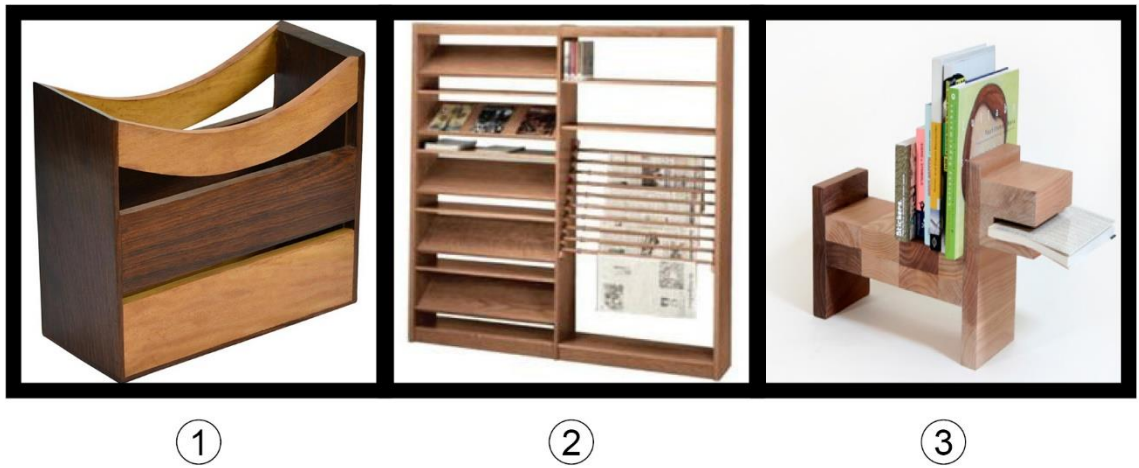


Figure 59: Three examples— 1¹⁸⁹, 2¹⁹⁰, and 3¹⁹¹—of simple ways to incorporate amenities such as a newspaper rack or magazine stand, which can offer mental stimulation to interested residents. Newspaper racks are ideal because they keep the papers organized and the space clutter-free.

¹⁸⁹ Home Shop 18. 2016. Magazine Rack. Accessed February 20, 2016. <http://www.homeshop18.com/magazine-racks/>.

¹⁹⁰ Pinterest. n.d. Pinterest`. Accessed February 20, 2016. <https://www.pinterest.com/pin/505388389408619940/>.

¹⁹¹ Like Cool. 2016. Pack of Dogs. Accessed February 20, 2016. http://www.likecool.com/Pack_Of_Dogs--Furniture--Home.html.

Activity Room

Introduction

Aside from the kitchen and bedroom, the activity room is a place where many residents spend extended time. The activity room can be situated in the living room with all the furniture pushed to the side, or it can be a stand-alone room. In the activity room, the residents can take part in exercise classes such as tai-chi, aerobics, and stretching. Events such as arts and crafts can also take place in this room.

Guideline

- Situate the activity room along an exterior wall to allow natural light and air to enter the room freely.
- Attach a restroom to the activity room.
- Design ample storage space in the room for the different types of equipment and tools needed for the various activities.
- Use sheet vinyl flooring with a matte-finish and wood appearance to provide adequate grip and easy cleaning.
- Design the room acoustics to account for loud noises and for storytelling, singing, and playing of instruments.
- Calculate the size of the activity room on a case-by-case basis. It should be able to accommodate about one-third of the facility's residents at a time.
- The activity room can be used as another destination point for residents who wander.

Back of House (BOH)

Introduction

The Back of House (BOH) of a Dementia Care Facility should be carefully integrated into the facility's floor plan. BOH components consist of the nurses' station, the nurses' locker room, staff restrooms, the administrator's office, other offices, private meeting or conference rooms, the break room, the janitors' closet, parking, and storage. These components are functional rather than glamorous and, for the most part, should not be seen by the residents or the public. The BOH should be designed based on a holistic approach. The BOH is a vital part of any facility and must be carefully planned for. Sometimes parts of the BOH are forgotten in the original design and end up in areas to which residents have access; this should be avoided.

Guideline

- Ensure the BOH components are secure and feature measures that prevent residents from gaining access, including specialized door locks.
- Hide the parking either behind the facility or underground because it may have a negative effect on some residents.
- Underground parking also allows the facility to have a larger wandering garden (see figure 61).



Figure 60: Kahala Nui incorporated underground parking into their design. This allowed them to create a large park space on their property.¹⁹²

¹⁹² Image from Google Earth

Exterior Guidelines

Introduction

The exterior guidelines of a Dementia Care Facility are equally as important as the interior guidelines. The purpose of the exterior guidelines is to provide places that can help stimulate the residents' physical and mental beings. Each component is vital to the facility's success. Exterior guidelines focus on the facility's physical context, paying attention to such factors as prevailing winds, sun paths, and surrounding buildings. Other components covered are ground preparation, outdoor furniture, and security. Each of these can help to minimize resident agitation, aggression, and anxiety.

The following guidelines are designed for the general population of residents at a Dementia Care Facility. However, different individuals may react differently to the same architectural components.

Neighborhood Approach

Introduction

The first thing any architect or designer should do when creating a Dementia Care Facility is decide on the kind of neighborhood in which the facility should be to built. In Hawai'i, the cost of land is expensive. It is often a central and limiting factor in choosing a building site. If the proposed site is located near other structures, it is a good idea to consider the neighboring buildings and the security of the neighborhood. Controlling the environment inside a facility is a relatively straightforward task; the outside, however, is harder to control, especially elements such as noise and security.

Guidelines

- Choose a neighborhood with a low crime rate.
- Situate the facility near a park or recreational area where residents and their families can picnic or stroll together during visits.
- Also situate the facility near a shopping complex or mall (see figure 62).
- Use trees to help control neighborhood noises.
- Ensure that outdoor acoustics range from 60 to 70 decibels.
- Vehicular traffic on adjacent roads should be mild to mid-moderate.
- Neighboring businesses should not be industrial.
- Create a friendly and inviting curb appeal.
- Set a clear path from the sidewalk to the front entrance.
- Parking should be accommodated within the facility design.
- The facility should be within walking distance of the community.

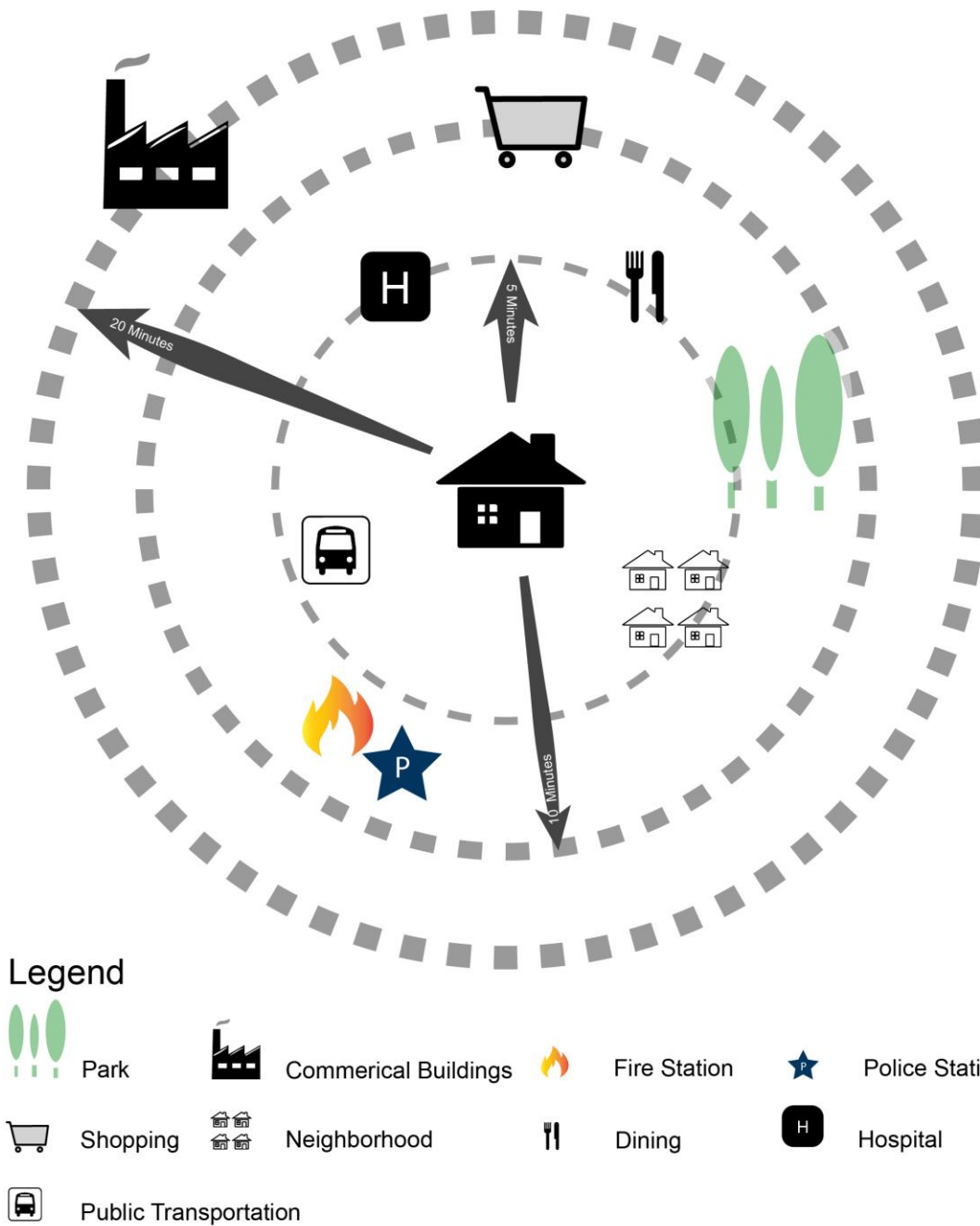


Figure 61: Ideal proximity diagram showing walking distances from the facility to nearby components.

Source: Author

Site Orientation

Introduction

Site orientation is the first step in sustainable design. Site orientation involves understanding the sun's path, prevailing winds, noise sources, and negative distractions. Architectural programs exist to assist the designer to better orient the building on the site. Site orientation is important in a design because it can minimize the amount of cooling needed and maximize the amount of natural light entering the building.

Guidelines

- Use software programs such as DIVA for Rhino, Ecotect, and Lighting Analysis for Revit, Revit, and Revit Architecture to simulate light entering the building before it is built in order to make better, more sustainable design decisions.
- Situate the longest face of the building perpendicular to the prevailing winds (see figure 63).
- Understand the location and sources of noise around the site.
- Orient the building to hide or camouflage negative distractions such as parking lots and busy intersections.

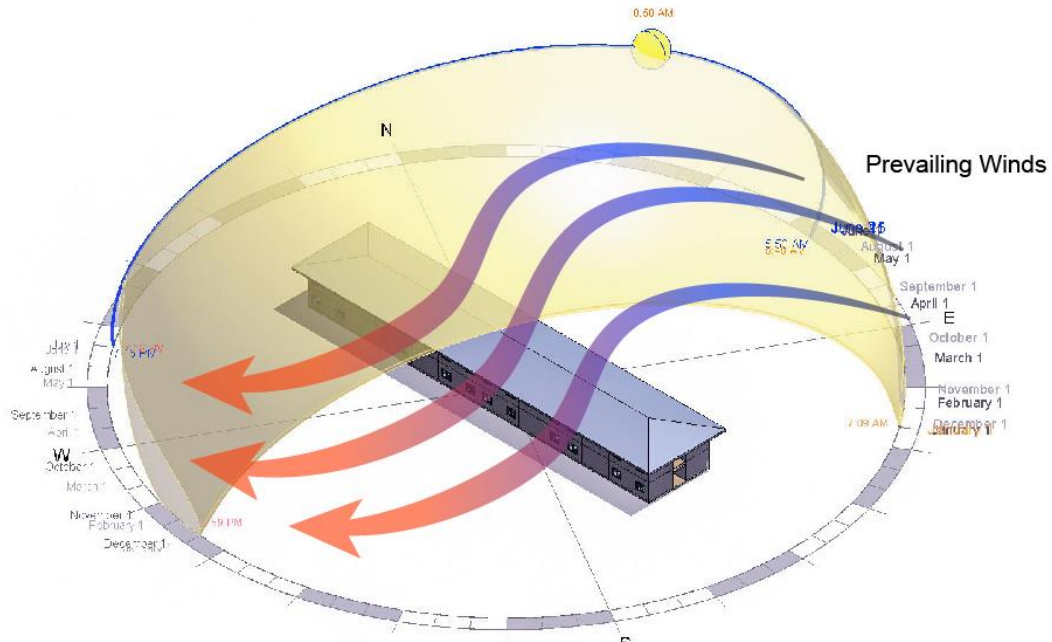


Figure 62: By using site analysis features within Revit Architecture, architects and designers can gain a general understanding of how the sun will affect the building as well as the general direction of the prevailing winds. The diagram above is an example of a building showing sun and wind direction from the summer through winter equinox.

Source: Author

Building Appearance

Introduction

During the schematic phase of design, the exterior appearance of the building is just as important as the interior appearance. With homelike integration as a driver for the design, it is best to design the exterior of the facility to resemble a home rather than an institution or hospital. The building's exterior façade will always be the first thing a family experiences when visiting a facility. The front façade is the part families will pay the most attention to.

Guidelines

- Incorporate small roofs, exterior storm shutters, and other elements to help break down the scale of the building (see figure 64).
- Use exterior windows to help break up the overall height appearance of a building.
- Plant vegetation and install water features to help ease the connection between the building and site. Vegetation and trees can also hide parts of the building or facility that architects and designers do not want residents to see, such as cars or pedestrians entering and leaving the facility.
- Placing a porte-cochère at the entrance can help make the scale of the building more manageable for residents. This also provides protection from the weather for those entering and exiting a vehicle (see figure 64).
- Set the overall facility back from the entrance to help break down the scale of the building.
- Avoid using institutional colors for exterior paints. This includes whites and grays.
- Consider drawing inspiration from the site's surrounding context. Homelike integration for building appearance involves blending in with the environment, not standing out.



①

②



③

Figure 63: Examples 1¹⁹³ and 2¹⁹⁴ are images of two different entry façades of The Plaza Assisted Living facilities that successfully break down the scale of the building. The buildings also blend into the surrounding neighborhoods well. Example 3¹⁹⁵ does not resemble a home but does incorporate trees and vegetation to break down the scale of the building.

¹⁹³ MW Group, Ltd. 2015. The Plaza Assisted Living. Accessed April 20, 2015.
<http://www.mwgroup.com/property/plaza-mililani> The Plaza Assisted Living. 2015.

¹⁹⁴ The Plaza Assisted Living. Accessed December 22, 2015.
<https://www.facebook.com/ThePlazaAssistedLiving/photos/pb.121696281237347.-2207520000.1450825967./1020108981396068/?type=3&theater>

¹⁹⁵ PBR Hawaii. n.d. Kahala Nui - Senior Living. Accessed April 24, 2015.
<http://pbrhawaii.com/?project=kahala-nui-senior-living>.

Outdoor Acoustics

Introduction

Outdoor acoustics are just as important as indoor acoustics. The advantage of working with outdoor acoustics is that there are many soft surfaces into which sound can be absorbed. Daily tasks can often cause frustration, anxiety, or agitation. Having a place on the property that is removed from the fast-paced life inside offers residents a place where they can find peace and re-center themselves. The sounds of the wind in the trees, birds chirping, and the cars in the distance can help diminish and calm agitation and anxiety.

The frontal lobe is where the brain controls feelings, emotions, and reasoning; this is usually the first part of the brain to be affected by Alzheimer's disease. When residents are in the garden, they may recognize a sound or object but are not necessarily able to put it to words. Working with the residents to identify the sound or object can have a huge effect on them. A small event like this, the recognition that they can still cognitively access parts of the world around them, can give them a lasting sense of dignity.

Guidelines

- Ensure that the decibel levels stay between 60 and 70 decibels.
- Use plants and trees to help buffer unwanted noise.

Table 20: Decibel Chart.

Decibel (dB)	Sounds like
30	Reading a book at the Honolulu Library
40	A quiet residential area Kapiolani Park in the morning
50	Kapahulu Avenue in the morning
60	A normal talking voice A restaurant with a few people
70	A telephone ringing H-1 traffic Dinner time at Zippy's
80	An alarm clock ringing An alert monitor at close range The Bus or a large truck driving by
90	A person cutting grass with a lawnmower
100	A car with a loud exhaust A motorcycle riding by

Wandering Gardens or Therapeutic Gardens

Introduction

The vegetation around a Dementia Care Facility can offer multiple benefits. If the facility is near a busy road, vegetation can act as a buffer for traffic noises. If there is no traffic in the area, the sound of the wind blowing through trees and bushes can help stimulate the hearing sense of residents wandering or relaxing outdoors. Vegetation can also disguise the cold, sterile look of any security fencing; the sight of such fencing may feel restrictive and institutional rather than homelike.

From a sustainability standpoint, vegetation can provide natural shading around the south, west, and east façades of the building. Bio swales and below-the-surface water catchment units can be placed under the vegetation if the care facility is in an environment that receives a lot of rain.

Wandering gardens or therapeutic gardens are an ideal addition to a Dementia Care Facility. They offer not only a place for older adults to burn off excess energy but also a setting for outdoor activities such as gardening and exercise. Gardens can also collect and control runoff from the rain or become an area for water catchment. If such gardens are installed, certain features must be taken into consideration, including:

1. Orientation or wayfinding
2. Privacy
3. Safety/security
4. Opportunity for resident interaction
5. Opportunity to engage motor and cognitive functions

Guidelines

- The pathway for a wandering garden or dementia garden should form a loop (see figure 65).
- Place multiple smaller wandering gardens or therapeutic gardens in different areas of the facility, if space allows. Small gardens can fit into smaller spaces and offer a more private experience.
- Include seating, a covered canopy, and tables where families can gather to spend time with their loved ones.
- The path width should be at least 7 feet wide to accommodate two wheelchairs passing each other.
- Keep the pathway clear of shrubs, plants, and trees to prevent any personal accidents.
- Incorporate benches with back rests into the landscape along the pathway for residents on foot to rest.
- Position shading canopies or trellises above the benches to minimize residents' sun exposure (see figure 65).
- Incorporate features such as birdfeeders, birdhouses, birdbaths, and plants that attract birds (see figure 65).
- All plants should be non-poisonous (see figure 66 for examples of local plants and materials that can be incorporated).
- For large outdoor areas, operable, retractable shade sails can be erected (see figure 67).

Rooftop Green Roof

- When space does not allow a garden on the facility property, a possible solution is a green roof, which can offer similar benefits to a ground level wandering garden.
- The parapet along the perimeter of the building should be set at an adequate height to prevent residents from falling over the edge.

- Conceal and secure any building utility units such as the cooling tower or any part of the HVAC system.
- If rooftop space is an issue, a possible solution is to build a smaller green roof and block off the HVAC units with a fence.

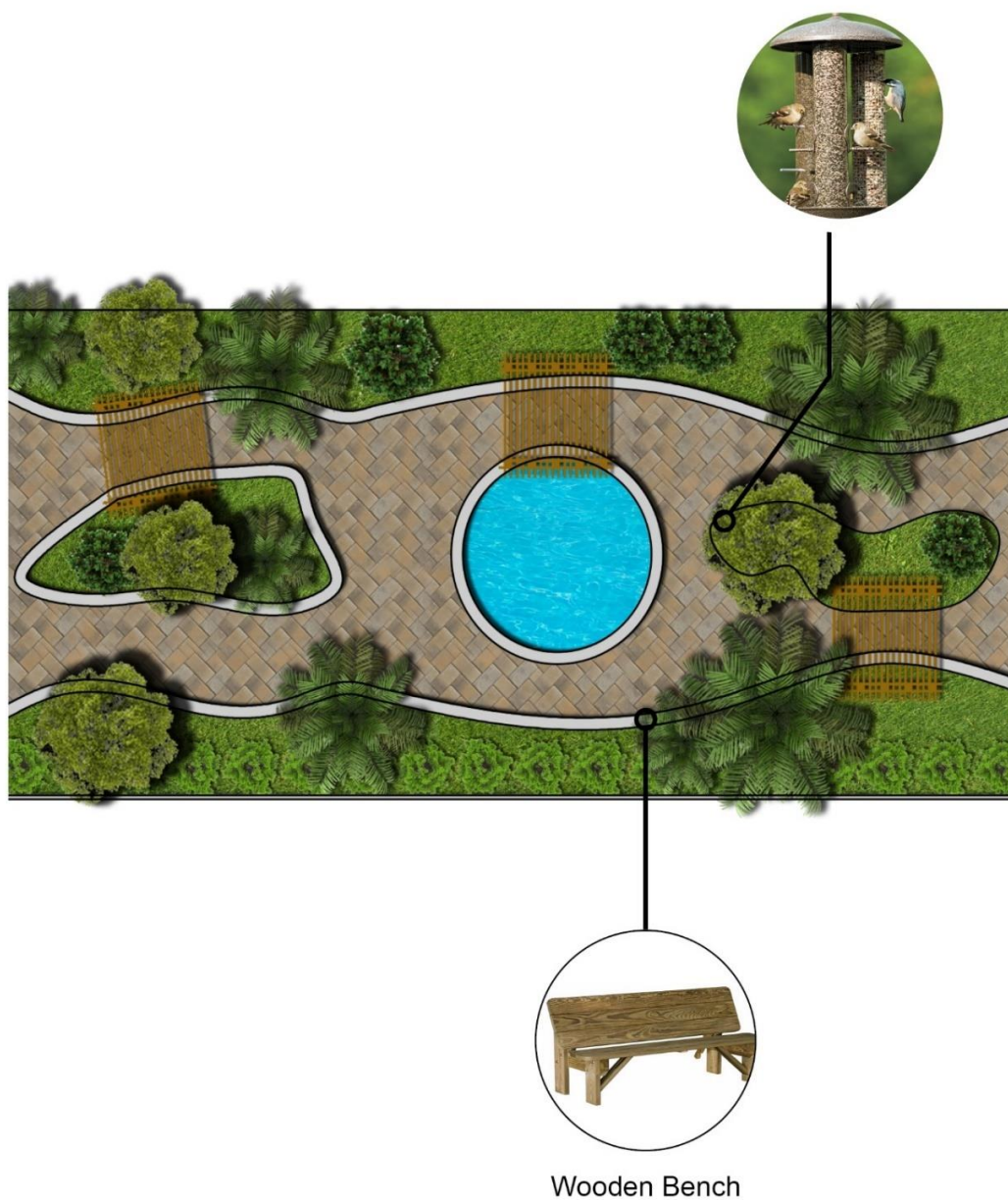


Figure 64: Placing bird feeders in unique places can promote visual stimulation.¹⁹⁶
¹⁹⁷

Source: Author

¹⁹⁶Benches5.copm. 2015. wooden garden bench tesco. Accessed February 12, 2016.
<http://benches5.com/wooden-bench-outdoor-must-feature-weather-resistance-and-high-style/wooden-garden-bench-tesco/>.

¹⁹⁷ Dr. Foster and Smith. 2015. Sturdy Bird Feeder. Accessed February 12, 2016.
<http://www.drsfostersmith.com/sturdy-bird-feeder-th.html>.

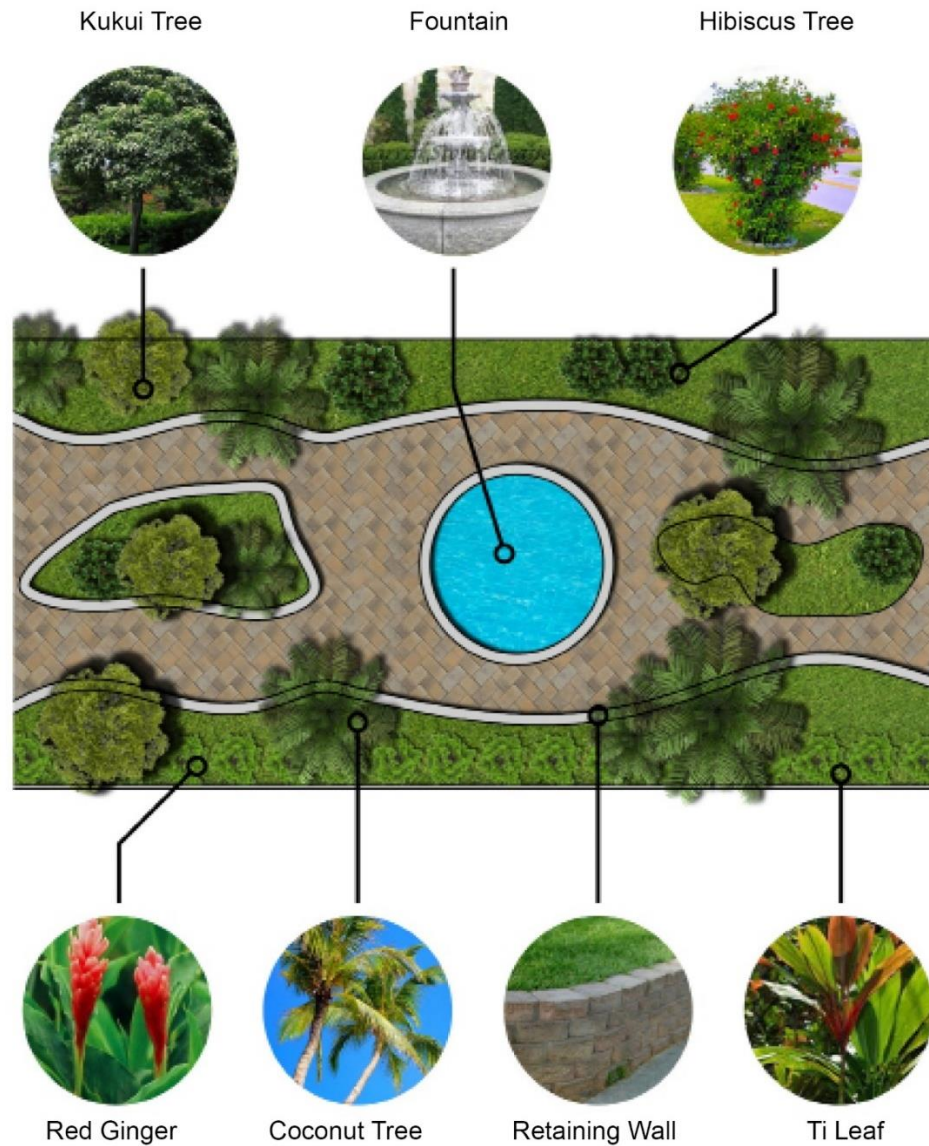


Figure 65: An environmental diagram showing different local plants and materials that can be used in the design of a wandering garden.¹⁹⁸

Source: Author

¹⁹⁸ Day, Julie. 2009. How to Build a Stackable Block Retaining Wall. Accessed February 12, 2016. <http://www.todayshomeowner.com/how-to-build-a-stackable-block-retaining-wall/>.



Figure 66: Sun shade sails can span large distances. Sails are constructed of HDPE fabric that allows a limited amount of light through.¹⁹⁹

¹⁹⁹ Collection, Umbrosa. 2015. Ingenua Shade Sail System. Accessed January 3, 2016. <http://umbrosa.shadescapesamericas.com/collections/ingenua-shade-sail-system/products/ingenua-sails-triangle>.

Ground Preparation

Introduction

Ground preparation is important in any outdoor environment. The ground should be firm and secure. Proper drainage is important around pathways in wandering gardens and therapeutic gardens to prevent accidents caused by wet conditions. Using a permeable surface creates a solid pathway that absorbs water (or liquid) and sends it to a holding tank through underground swales (see figure 68).

Guidelines

- It is important to pay attention to the texture of the paver (see figure 69). Even though it may be made of concrete or rock, it is a good idea to pour water onto the paver or tile to check its slippage.
- Pavers should interlock with one another.
- Paver textures should provide wayfinding assistance throughout the garden.
- A 5-foot diameter should be sufficient for a wheelchair to maneuver with ease.
- Slopes should not exceed 1:12.
- Place handrails along the pathway for assistance.

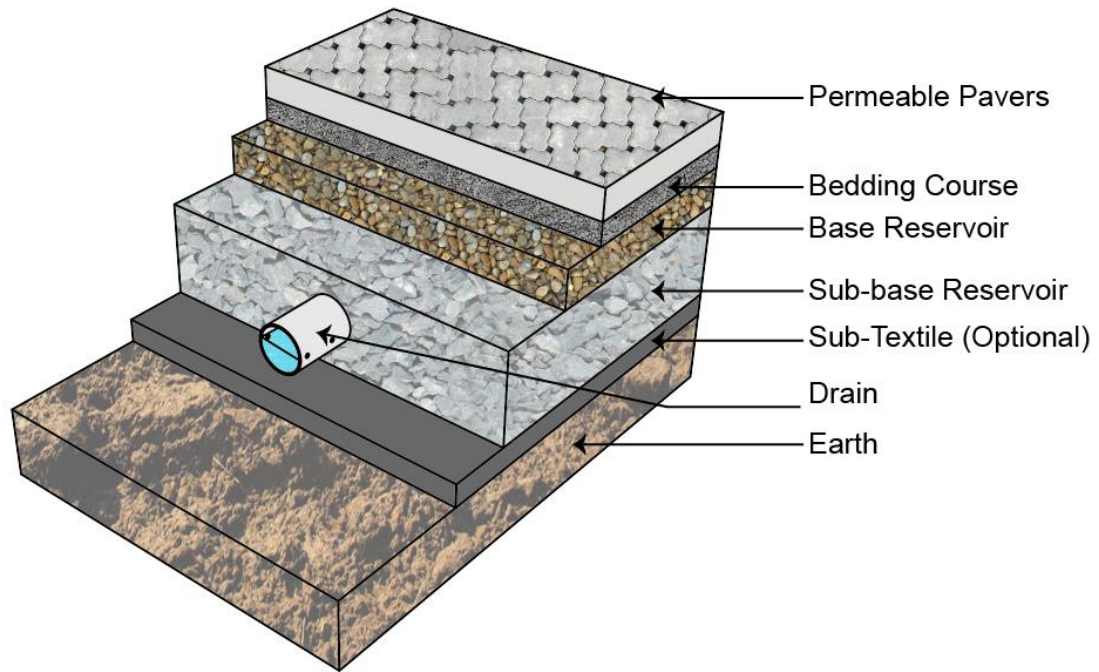
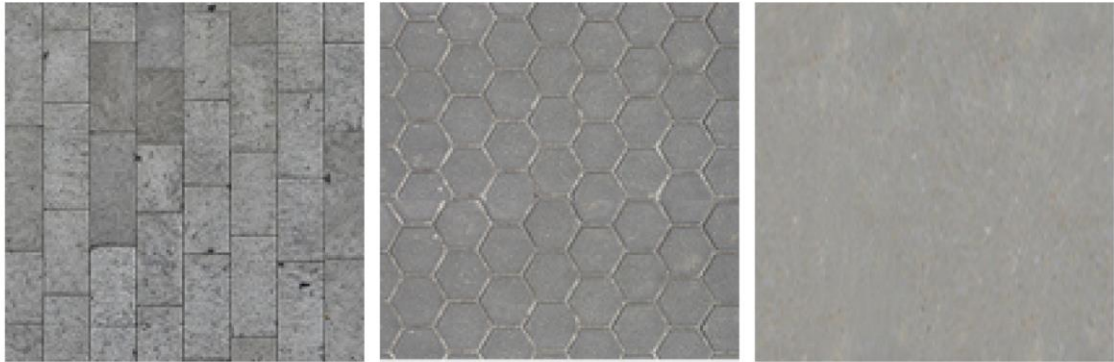


Figure 67: Cut-a-way of a permeable paver

Source: Author



Examples of good pavers and paving materials for wheelchair accessibility.



Examples of bad pavers and paving materials for wheelchair accessibility.

Figure 68: Examples of good and bad pavers and paving materials for wheelchair accessibility.

Source: Author

Outdoor Furniture

Introduction

At a Dementia Care Facility, outdoor furniture must be firm, easily accessible, and tip proof. As adults age, the incidence of falling and magnitude of injury increases. Choosing and properly installing furniture can prevent unnecessary accidents. Exterior furniture will also be affected by the elements, which can cause them to fade or rot. Choosing durable, weatherproof furniture is important.

Guidelines

- Outdoor furniture materials should be made of wood or other rot-resistant materials.
- Outdoor furniture should not be reflective, and should have a low transfer of heat and a good life expectancy.
- Materials such as aluminum with vinyl, Trex®, and concrete are good choices for seating material (see figure 70).
- Seat height should be between 17 and 19 ½ inches tall.
- Outdoor furniture edges should be blunt or rounded. Avoid furniture with sharp edges.
- Outdoor furniture color should contrast with its environment.
- Choose furniture that provides proper back support and keeps the user upright.
- Place furniture strategically to provide resting places where the distance of travel may be long for the residents.



Figure 69: An example of a Trex Outdoor Furniture bench that has the appearance of a typical wooden bench.²⁰⁰

²⁰⁰ 1450825967. Trex Outdoor Furniture. 2015. Yacht Club 48" Bench. Accessed December 24, 2015. <https://www.trex furniture.com/yacht-club-forty-eight-inch-bench.html>.

Outdoor Security and Safety

Introduction

Outdoor security is just as important as any other type of security within a Dementia Care Facility. Functional outdoor security, whose main purpose is to keep something in or out, tends to look very institutional and unappealing. Thus, it is important to ensure that the environment is not only secured and safe but also respects the residents' sense of dignity. There are many ways to soften the institutional feel of outdoor security systems; figure 72 shows examples of how a facility can soften the perimeter fence with landscaping.

Guidelines

- The facility's perimeter should be secured with controlled access points.
- Use colors commonly associated with the specific area or room. For example, a garden will typically include colors such as red, green, yellow or blue.
- Minimize dead end space by designing the path in the shape of a loop.
- Gates, fences, and locks should be camouflaged to minimize attention (see figure 72 for examples of how to camouflage a fence).
- The height of the exterior fence should be at least 6 feet.
- Padlock or keycard locks should be used for exterior gates.
- Incorporate site components such as clusters of trees, trellises, raised planting beds, and pergolas to provide shade and to break up larger spaces.



Figure 70: Examples of how a perimeter fence can feel too institutional.

Source: Author



Figure 71: Examples of how landscaping can camouflage the perimeter fence.

Source: Author



Figure 72: An octagonal picnic table with umbrella on brick pavers make for a welcoming place for family members to gather.²⁰¹

²⁰¹ Furniture, Countryside 100% Hand-Crafted Amish. 2015. Delray Octagon Picnic Table. Accessed January 3, 2016.
<https://www.countrysideamishfurniture.com/product/delray-octagon-picnic-table>.

Sensory Environment

Introduction

This chapter covers the different sensory aspects of daily life in a Dementia Care Facility including sound, light, thermal comfort, smell, and touch. It is important for architects and designers to understand the architectural implementations that can benefit the daily lives of residents in a care facility.

The following guidelines are designed for the general population of residents at a Dementia Care Facility. However, different individuals may react differently to the same architectural components.

Interior Acoustics

Introduction

As adults age, their ability to hear often diminishes. According to the National Institutes of Health (NIH), roughly 33 percent of adults ages 65 to 74, 45 percent of adults ages 75 to 84, and 62 percent of adults older than 85 years have some trouble with hearing.²⁰² Many times, older adults with hearing loss have difficulty deciphering between people speaking directly to them and background noise. This can cause agitation and discomfort. For those with Alzheimer's disease, hearing loss can also cause confusion and, in an effort to understand the sounds he or she is hearing, a resident may start to wander and, without noticing, may enter restricted areas.

One thing a facility can do to help control unwanted noise is to incorporate music in all public areas. Music can be a powerful tool in helping residents with their cognitive, physical, emotional, and mental functions. Instrumental, calming, or local music is recommended over current music trends.

Guidelines

- Avoid large glass windows. Even though they allow a great amount of natural light into a room, they also allow in a great deal of outside noise.
- The placement of doors is important for noise control. Aligning doors across from each other causes sound to transfer directly from one room to the next while staggering doors may help buffer the transfer of noise.
- The use of niches with planters can help reduce unwanted noise. Both the niches and the softer surfaces of plants can help mitigate the transfer of noise.
- Allow the residents to have radios or music players in their rooms so they can choose the music they listen to.

²⁰² Brawley, Elizabeth C. 1997. *Designing for Alzheimer's Disease*. New York: John Wiley & Sons, Inc. 136.

- Incorporate speakers evenly throughout the facility to minimize any delay or muffling of sound.

Floor

- Carpets, floor mats, drapes, flooring material, and fabric furniture can be used to help absorb noise.
- In high traffic areas such as the nurses' station, elevator, or kitchen, different flooring materials should be used to help absorb unwanted noise. Carpet is a better choice than hardwood flooring.
- When choosing carpet, make sure the maximum thread thickness is less than a quarter-inch thick.

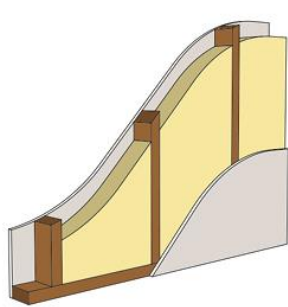
Walls

- Different wall construction types should be used to reduce the transfer of noise from one room to another. These include double walls, staggered double walls, and double stud walls (see figure 74).
- Batt insulation, rigid insulation, or spray foam insulation also reduce the transfer of noise from one room to another (see figure 75 for different examples).
- Sound Transfer Class is a rating of a material's ability to reduce the transfer of airborne noise. The STC chart is a useful resource when choosing materials for the floors, walls, and ceilings. (see table 24 for STC measurement examples).

Ceilings

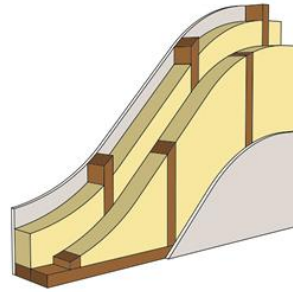
- When choosing ceiling materials, the architect or designer must take into consideration the high noise reduction co-efficient (NRC), the amount of sound that is reflected back from the surface of a material.
- Incorporate recessed ceilings in alcoves to provide a sense of security.
- Avoid using Acoustic Ceiling Tiles (ACT).

- Use Gypsum wallboard in the ceiling with a knockdown or spray texture.
- Choose ceiling colors that contrast with the walls.
- If using ceiling patterns, do not use bold patterns (see figure 76 for ceiling material and texture examples).



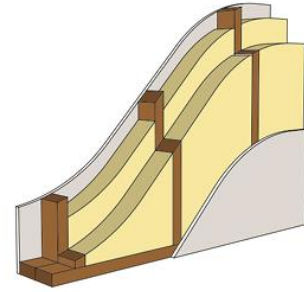
Double wall with
insulation and Gypsum
Wall Board

STC: ~ 40



Staggered double wall
with insulation and
Gypsum Wall Board

STC: ~ 49



Double stud wall
with insulation and
Gypsum Wall Board

STC: ~ 51

Figure 73: Examples of different wall types that can help mitigate sound transfer.

Source: Author

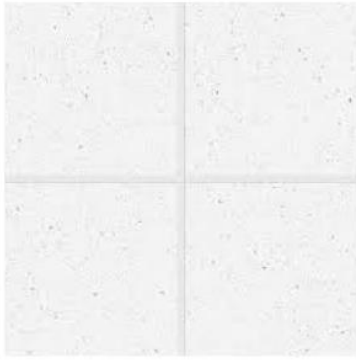


Figure 74: 1) Dow Rigid Insulation, 2) Batt Insulation, and 3) Spray Foam Insulation are three different types of insulation that offer different acoustic and workability properties.

Table 21: STC Chart describing the different materials and their STC absorption rate.²⁰³

STC	Partition type
33	Single layer of 1/2" drywall on each side, wood studs, no insulation (typical interior wall)
39	Single layer of 1/2" drywall on each side, wood studs, fiberglass insulation
44	4" Hollow CMU (Concrete Masonry Unit)
45	Double layer of 1/2" drywall on each side, wood studs, batt insulation in wall
46	Single layer of 1/2" drywall, glued to 6" lightweight concrete block wall, painted both sides
46	6" Hollow CMU (Concrete Masonry Unit)
48	8" Hollow CMU (Concrete Masonry Unit)
50	10" Hollow CMU (Concrete Masonry Unit)
52	8" Hollow CMU (Concrete Masonry Unit) with 2" Z-Bars and 1/2" Drywall on each side [4]
54	Single layer of 1/2" drywall, glued to 8" dense concrete block wall, painted both sides
54	8" Hollow CMU (Concrete Masonry Unit) with 1 1/2" Wood Furring, 1 1/2" Fiberglass Insulation and 1/2" Drywall on each side [4]
55	Double layer of 1/2" drywall on each side, on staggered wood stud wall, batt insulation in wall
59	Double layer of 1/2" drywall on each side, on wood stud wall, resilient channels on one side, batt insulation
63	Double layer of 1/2" drywall on each side, on double wood/metal stud walls (spaced 1" apart), double batt insulation
64	8" Hollow CMU (Concrete Masonry Unit) with 3" Steel Studs, Fiberglass Insulation and 1/2" Drywall on each side
72	8" concrete block wall, painted, with 1/2" drywall on independent steel stud walls, each side, insulation in cavities

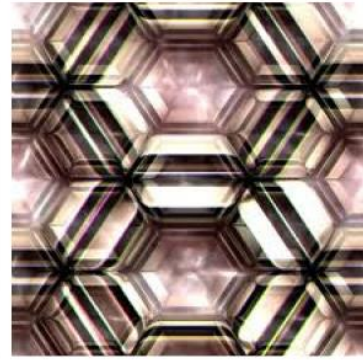
²⁰³ Harris, Cyril. 1994. Noise Control in Buildings: A Practical Guide for Architects and Engineers. Texas: McGraw-Hill.



Acoustical Ceiling Tile
(ACT)



Gypsum Board Ceiling
with a smooth finish



Ceiling tile that is too
busy and bold



Seamless acoustical
wood ceiling



Gypsum Board Ceiling
with a knockdown finish



Gypsum Board Ceiling
with an orange skin finish

Figure 75: The top row shows examples of ceiling materials and finishes to avoid in a Dementia Care Facility. The bottom row shows acceptable ceiling materials and finishes.

Lighting

Introduction

Lighting is an important design element that can affect a resident's circadian rhythm.²⁰⁴ The circadian rhythm, the body's cycle over a twenty-four period, regulates heart rate, blood pressure, body temperature, and sleep cycles. As an older adult progresses through the stages of dementia, his or her body loses its ability to regulate these things.

Dementia Care Facility residents also typically need two to three times more lighting than healthy young people do. Often, as humans age, the ability to see gradually weakens while sensitivity to glare heightens. In those with Alzheimer's disease and dementia, glare can lead to hallucination, agitation, and confusion. Therefore, it is important to ensure that the various lighting elements of a facility create as little glare as possible (see the section, *Glare*, for further suggestions).

Guidelines

- By setting a light fixture to exert an electrical output of 2000 lux, the body will reset its circadian rhythm, causing a sleeping person to wake up.
- The use of bright light, however, can make a care facility feel too sterile and institutional; therefore, a dimmer should be installed to adjust to the brightness of light depending on the resident.
- For everyday activities and business, 500 lux or less is suitable.
- Ensure that adequate lighting is provided in threshold areas such as openings in walls and doorways.
- Eliminate glare from natural sunlight and light fixtures. Glare can cause daily discomfort and can be dangerous to those with advanced-stage dementia; glare can visually confuse a resident, causing him or her to trip or fall.

²⁰⁴ Ibid. 73.

- Provide easy-to-handle task lights for residents engaged in activities that might require more area lighting.
- Use matte finishes on materials to reduce glare.
- Choose rocker rather than toggle style light switches. These are easier for those with arthritis to use.

Table 22: Minimum illumination levels recommended for a Dementia Care Facility using daylight or electrical lamps with a CRI value of 80 or more as specified by the Illumination Engineering Society of North America.

Areas	Minimum Illumination Levels	
	Ambient Light	Task Light
Administration	30	50
Activity Areas	30	50
Visitor Waiting (Day)	30	
Visitor Waiting (Night)	10	
Barber	50	
Quiet Area	30	
Hallways (Active Hours)	30	
Hallways (Night)	10	
Dining Room	50	
Exterior Entrance	10	
Interior Entrance (Day)	100**	
Interior Entrance (Night)	10	
Exit Stairway	30	
Elevators	30	
Medicine	30	100
Nurses Station (Day)	10	50
Nurses Station (Night)	30	50
Examination Room	30	100
Soiled Linen Utility	50	

Areas	Minimum Illumination Levels	
	Ambient Light	Task Light
Kitchen	30	100
Resident Bedroom	30	
Wardrobe	30	
Shower room Entry	30	
Shower room	30	60
Shower/Bathing Rooms	30	

** Utilization of daylighting is encouraged in entryways to provide a transition between outside and inside illumination levels.

Source: The Illuminating Engineering society of North America²⁰⁵

²⁰⁵ Brawley, Elizabeth C. 1997. Designing for Alzheimer's Disease. New York: John Wiley & Sons, Inc. 89.

Smells or Odors

Introduction

Smells and odors are a common challenge of care facility daily life. Smells can prompt both positive and negative memories and responses from the residents. In a Dementia Care Facility, it is especially important to monitor smells and odors as they can trigger agitation, anxiety, and confusion among residents.

One of the first things many family members associate with a nursing facility is the smell of urine. It is important to provide adequate supervision to prevent or reduce urinary accidents. It is equally important to have procedures in place to quickly and effectively remove and neutralize odors and biological remains when accidents do occur.

Guidelines

- Follow the recommendations of the ANSI/ASHRAE Standard 62.1-2013 Ventilation for Acceptable Indoor Air Quality
- Incorporate odor sensors within the facility that are connected, wirelessly or wired, to the nurses' station.
- Provide adequate ventilation throughout the facility to help remove unwanted odors.

Reducing Glare

Introduction

Glare must be addressed in the design of any type of facility or home. Glare can cause great discomfort to older adults with Alzheimer's disease because it can create additional visual objects. As mentioned in Part 1, older adults with Alzheimer's disease lose their ability to distinguish objects because, as the disease progresses, they lose their ability to perceive depth, color, and contrast. They may appear to hallucinate, certain they are seeing objects that are not present.

Guidelines

- Use vinyl shutters, blinds, or curtains on the insides of windows and glass doors to help reduce glare from outdoor light (see figure 77 for examples of how shutters can control the flow of light entering a room).
- To reduce glare in transitional areas, provide coverings over porches and the entry into the foyer or lobby.
- Include taller windows, windows closer to the ceiling, and other indirect sources of lighting to create an even spread of light throughout the room.
- In common areas such as the living room, lobby, and dining areas, skylights in the ceiling can be added.
- Avoid reflective tiles or finishes on walls and floors, which can visually distract and agitate residents.
- Shading devices on the exterior facades of the building can help reduce the amount of light entering the building.
- For the northern and southern sides of the building, use vertical louvers or shading devices; for western and eastern sides, use horizontal louvers or shading devices (see figures 77 and 78).



①

②

③

Figure 76: Above are three examples of window treatments—1 , 2 , and 3 —that can be used in a Dementia Care Facility. It is important to pay attention to the shadows that these create. As Alzheimer's disease progresses, a person will start to hallucinate more of

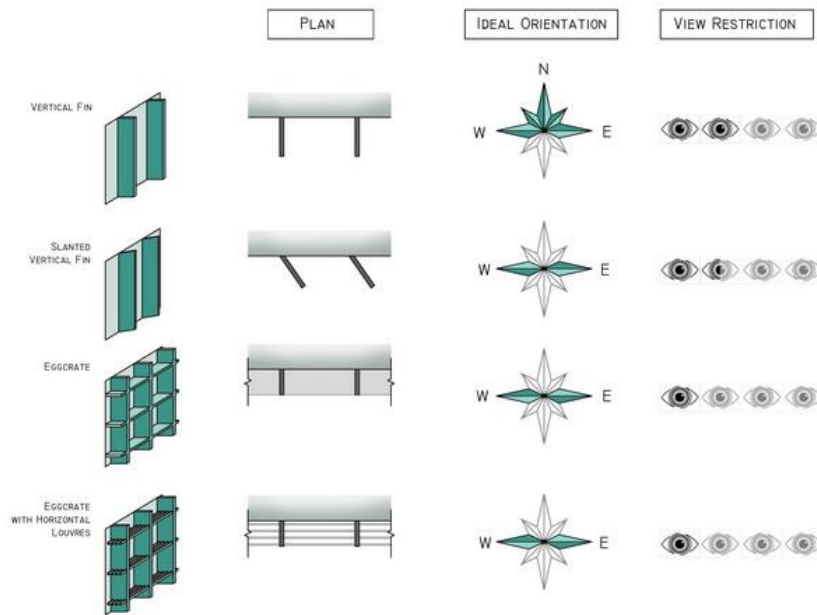


Figure 77: Vertical shading devices can effectively block the sun on the northern and southern facades.²⁰⁶

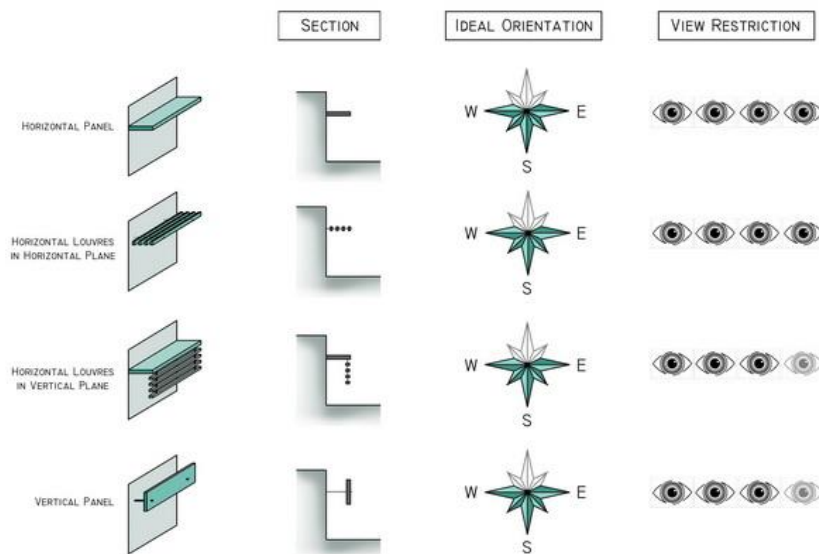


Figure 78: Horizontal shading devices can effectively block the sun on the western and eastern facades.²⁰⁷

²⁰⁶ American Institute of Architects. 2012. The Carbon Neutral Design Project. Accessed January 10, 2016. <http://www.tboake.com/carbon-aia/strategies1b.html>.

²⁰⁷ Ibid.

Color

Introduction

Color is defined by the light spectrum. Most human brains can perceive seven million different hues of color.²⁰⁸ Color is a tool that can be used to impact the quality of life of older adults in a care facility setting. Colors have the ability to promote specific emotions. For example, colors such as salmon, coral, peach, and yellow-orange can help older adults relax.²⁰⁹

In a Dementia Care Facility, color provides daily mental and visual stimulation that can benefit many residents. Different colors and textures provide different meanings and experiences. Colors can also be used to help older adults decipher objects in a room and better comprehend space. As Alzheimer's disease progresses, a person's perception of space becomes increasingly two-dimensional. People who do not suffer from Alzheimer's disease see the world like a movie—everything moves in fluid motion; many of those in later stages of Alzheimer's disease see the world in picture stills.²¹⁰

Guidelines

- Color contrast is a central aspect in the design of a Dementia Care Facility. Bold contrast can help improve residents' depth perception and visual comprehension (see table 27 for examples of good and poor color choices for contrast).
- Doors, furniture, tabletops, and countertops should have colors and textures that contrast with the walls and floors.
- Dishes should contrast with tabletops.

²⁰⁸ Brawley, Elizabeth C. 1997. *Designing for Alzheimer's Disease*. New York: John Wiley & Sons, Inc.108.

²⁰⁹ Ibid. 109.

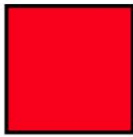
²¹⁰ Scott, Pamela. "Behavioral." Lecture, Alzheimer's Association Hawai'i Chapter, Honolulu, HI, February 29, 2016.

- Use existing color research to identify the colors that are more generally applicable to the specific human experiences and emotions being encouraged in a space (see figure 80).
- Because older adults have a hard time distinguishing colors, matching the exit door with the walls can help camouflage the door, preventing wandering residents from finding it unnecessarily.
- For best results, three to five colors should be selected for the entire facility.
- Make sure there is sufficient contrast between the wall and floor colors in each room and that each room's colors are chosen based on the room's role in facility life.
- Choose furniture colors that clearly separate the pieces from both the walls and the floors.

Table 23: Examples of good and poor contrasting color by Elizabeth Brawley in "Designing for Alzheimer's Disease."

Good Color Choices for Contrast	Poor Color Choices for Contrast
Light color against black	Dark green against bright red
Dark color against white	Yellow against white or similar light color
Light yellow against dark blue	Blue against green or similar bright color
Dark red against light green	Lavender against pink

What does each color mean?



Red can enhance human metabolism, increase respiration rate, and raise blood pressure. It has very high visibility, which is why stop signs, stoplights, and fire equipment are usually painted red. In heraldry, red is used to indicate courage.



Orange is a very hot color, so it gives the sensation of heat. Nevertheless, orange is not as aggressive as red. Orange increases oxygen supply to the brain, produces an invigorating effect, and stimulates mental activity. It is highly accepted among young people. As a citrus color, orange is associated with healthy food and stimulates appetite.



Yellow produces a warming effect, arouses cheerfulness, stimulates mental activity, and generates muscle energy. Yellow is often associated with food. Bright, pure yellow is an attention getter, which is the reason taxicabs are painted this color. When overused, yellow may have a disturbing effect; it is known that babies cry more in yellow rooms. Yellow is seen before other colors when placed against black; this combination is often used to issue a warning.



Green has great healing power. It is the most restful color for the human eye; it can improve vision. Green suggests stability and endurance. Green indicates growth and hope. Green opposes red.



Blue is considered beneficial to the mind and body. It slows human metabolism and produces a calming effect. Blue is strongly associated with tranquility and calmness. In heraldry, blue is used to symbolize piety and sincerity.



Purple combines the stability of blue and the energy of red. Purple is associated with royalty. It symbolizes power, nobility, luxury, and ambition. It conveys wealth and extravagance. Purple is associated with wisdom, dignity, independence, creativity, mystery, and magic.



White means safety, purity, and cleanliness. As opposed to black, white usually has a positive connotation. White can represent a successful beginning. In heraldry, white depicts faith and purity.



Black is a mysterious color associated with fear and the unknown (black holes). It usually has a negative connotation.

Figure 79: By understanding the meaning of colors and their psychological effects on people, architects and designers can make better color decisions.²¹¹

²¹¹ QSX Software Group. (2016, February 7). Color Meaning. Retrieved from Color Wheel Pro: <http://www.color-wheel-pro.com/color-meaning.html>

Patterns

Introduction

Patterns on furniture, floors, and walls can help add variety, contrast, and life to an otherwise bland, melancholy environment. However, bold patterns, which can agitate or confuse residents, should be avoided. Rather, seamless patterns that are neither too bold nor too bland should be used. Patterns and textures should resemble those commonly found in homes, such as a knocked down gypsum wall texture or the vertical grooves typically found in single wall construction.

Another thing to keep in mind when choosing patterns or textures is the roughness of a material. As residents age, some may take medications that make their skin prone to brushing and bleeding. Whenever possible, avoid using rough materials such as CMU walls or split face CMU walls. Also, use bullnose corner bead rather than standard corner bead on all corners. The bullnose can help to soften corners if residents brush or bump into them.

Guidelines

- Use contrasting patterns to help residents differentiate between objects and spaces.
- Avoid bold patterns, which can agitate or confuse residents (see figure 82).
- For dining areas, large patterns on chairs are acceptable. For multi-purpose areas, smaller patterns are recommended.
- Different patterns should be used for different rooms.
- Fabric patterns should match the scale of the room.

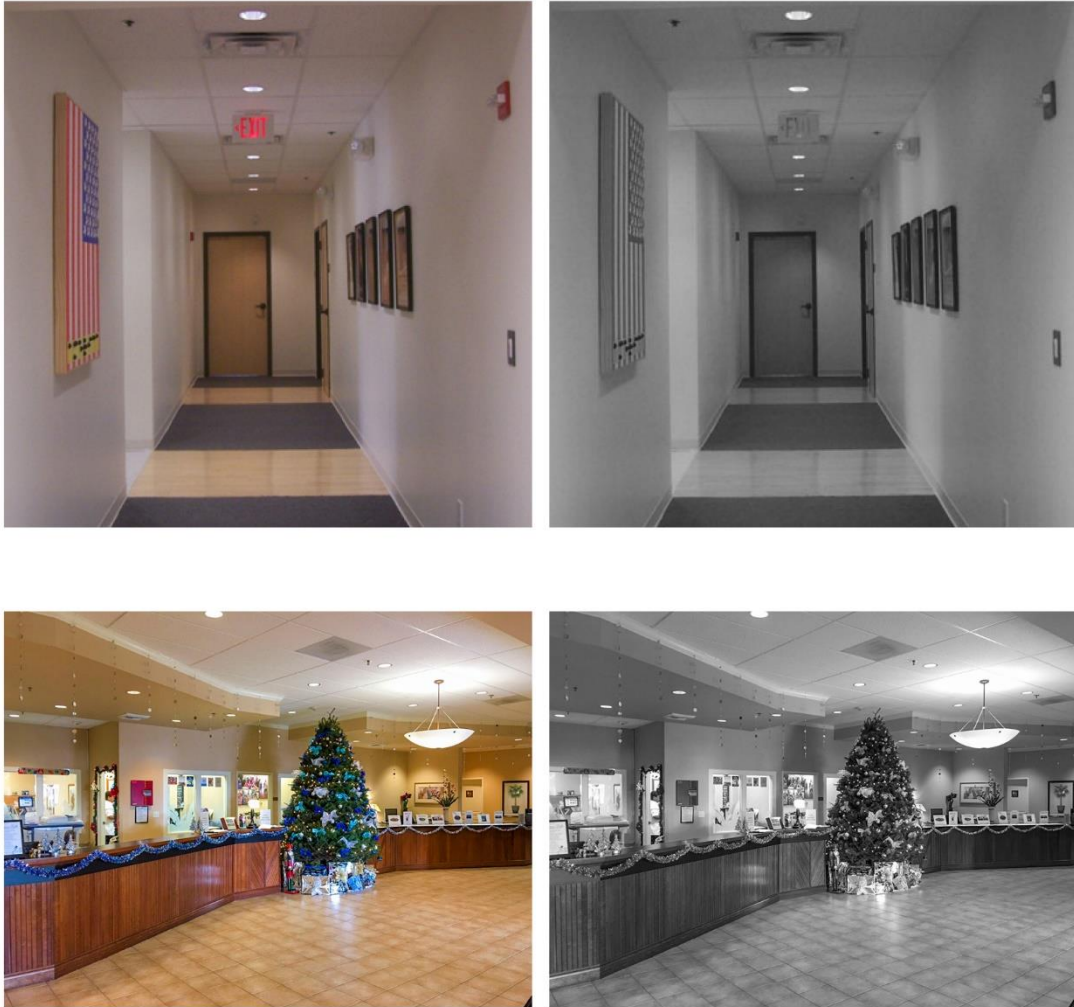
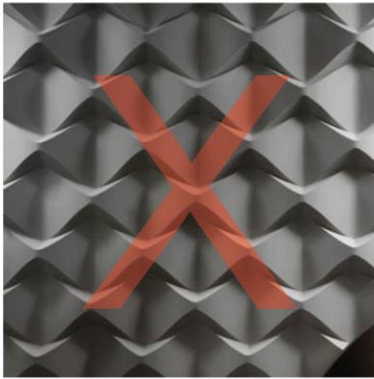


Figure 80: The pictures in the top row are an example of poor pattern and texture choices, which can further confuse a dementia resident's comprehension of space.²¹² As the ability to perceive colors fades, contrast is vital. The bottom pictures show a better use of patterns in design; the floor clearly contrasts with the casework.²¹³

²¹² American Foundation for the Blind. 2015. Esther's Place Virtual Tour. Accessed December 22, 2015. <http://www.afb.org/info/programs-and-services/center-on-vision-loss/what-we-do/esthers-place-virtual-tour/1234>.

²¹³ The Plaza Assisted Living. 2015. The Plaza Assisted Living. Accessed December 22, 2015. <https://www.facebook.com/ThePlazaAssistedLiving/photos/pb.121696281237347.-2207520000.1450825967./1020108981396068/?type=3&theater>.



Bold 3D texture not
suited for a Dementia
Care Facility



Non bold 3D texture
suited for a Dementia
Care Facility

Figure 81: The photo on the left²¹⁴ is an example a pattern that is too bold for a Dementia Care Facility; the second is an example of texture that is acceptable.

²¹⁴ Decoramialab. 2015. Dimensional Forms. April 14. Accessed March 15, 2016. <https://noticiasdecoramialab.wordpress.com/2015/04/17/formas-tridimensionales-2/>.

Thermal Comfort

Introduction

Thermal comfort is important to all residents. For those with Alzheimer's disease, as they progress through the stages, it becomes increasingly difficult regulate body temperature, making them highly vulnerable to temperature changes in their environment. Residents will often wear sweaters to help control their body temperature, regardless of the season or the facility temperature. The weather outside can be 85 degrees Fahrenheit with a 90 percent humidity level, and some residents will still wear sweaters.

Hawai'i experiences fairly consistent weather throughout the year which makes designing a facility simpler here than in places with more distinct seasons changes.

Guidelines

- Air conditioning should be used sparingly. It should only be used on days when there are no trade winds or when vog (volcanic smog) is present.
- Design the facility with adequate adjustable openings to allow maximum cross ventilation through the building (see figure 82).
- The average temperature in the facility should remain between 72 and 78 degrees Fahrenheit.

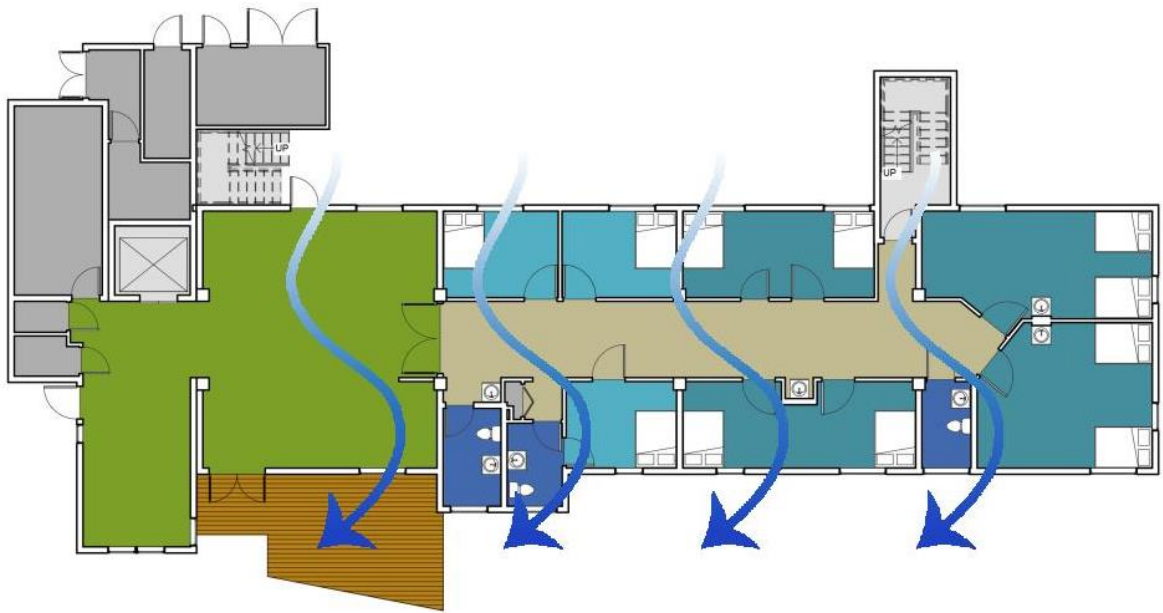


Figure 82: Cross Ventilation Diagram of the Manoa Cottage in Kaimuki.

Source: Author

Linking the Interior Space with the Exterior Space

Introduction

Humans spend an increasing amount of time indoors in air-conditioned environments. Many chronic diseases stem from spending too much time indoors, such as sick building syndrome and various mold-related illnesses. Linking the interior and exterior spaces in a facility allows a continuous natural flow of clean, outside air through the facility. The Manoa Cottages in Kaimuki is an example of a care facility that successfully incorporates natural ventilation into the building's design.

Guidelines

- Incorporate natural ventilation in the facility to bring in fresh, clean air and cycle out used air.
- One way to incorporate outdoor and indoor spaces is through the use of sliding accordion doors (see figure 83).
- Another way to encourage natural airflow is through the installation of large openings along the sides of the building perpendicular to the prevailing winds.
- Porches and lanais are a link between indoor and outdoor spaces that can be used as places for residents and their families and visitors to gather and sing, talk, and eat together.



Figure 83: An example of how an accordion door links two spaces and allows natural light and air into a facility.²¹⁵

²¹⁵ Thomas Jacobson Construction, Inc. 2012. Seattle Green Home Project. Accessed January 15, 2016. <http://www.thomasjacobson.com/our-work/featured-projects/seattle-green-home-project>.

Interior Guidelines

Introduction

Interior guidelines can help architects and designers make smarter interior design decisions when designing a Dementia Care Facility. Interior guidelines focus on wayfinding, spatial layout, interior security, window performance, door specifications, and daylighting. Each of these is vital to the success of a Dementia Care Facility and, if designed properly, can help minimize agitation, aggression, and hallucinations.

The following guidelines are designed for the general population of residents at a Dementia Care Facility; however, different individuals may react differently to the same architectural components.

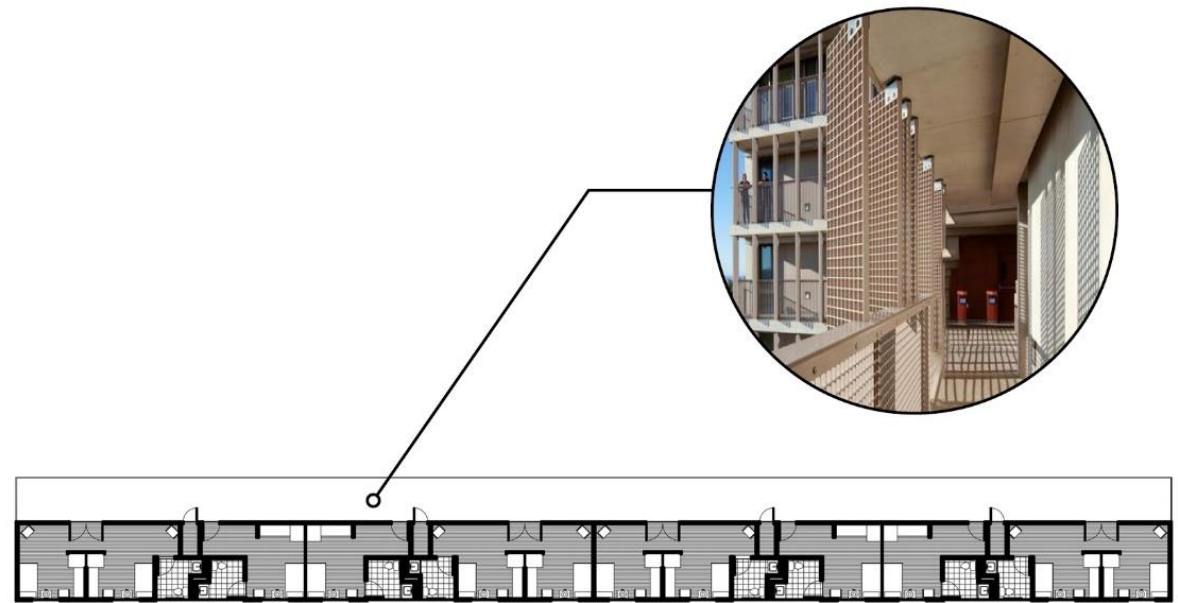
Wayfinding

Introduction

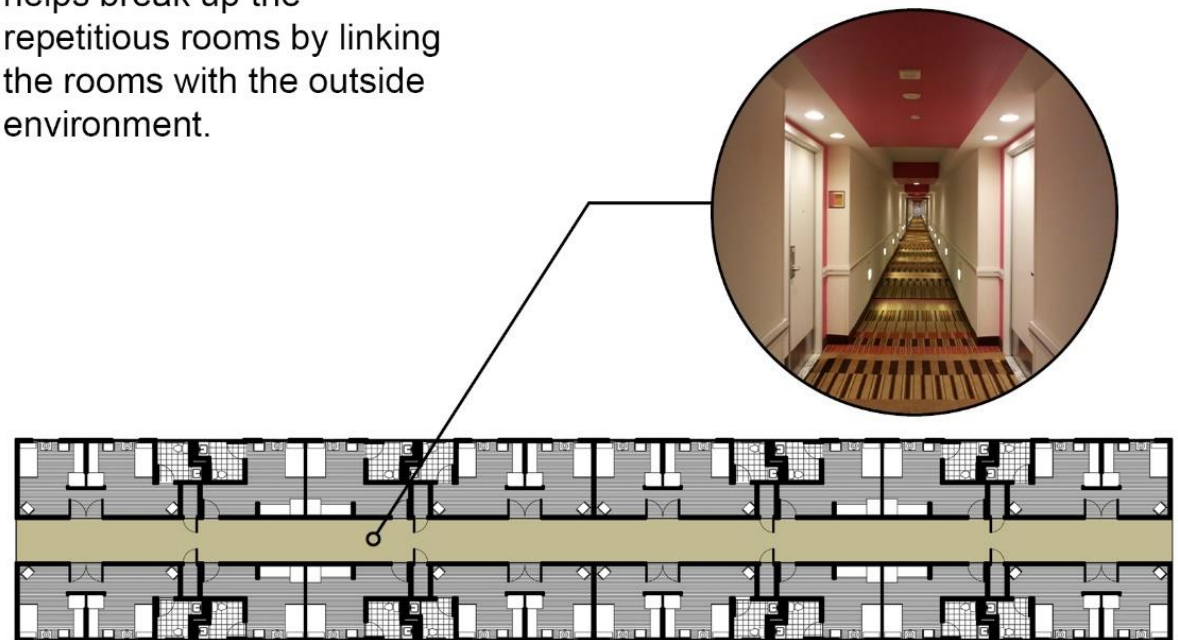
Wayfinding refers to the ways people orient themselves in space and navigate from one place to another. Architectural components must be incorporated into a facility design to help residents easily move through the spaces. On a large scale, both the natural and built environments provide landmarks by which people navigate and orient themselves. For example, it is common for residents of Honolulu to wayfind by locating major landmarks such as specific buildings or those related to the four local directions: mauka (mountain side or north), makai (ocean side or south), Diamond Head (east), and ewa (west).

Guidelines

- Keep wayfinding elements as simple and obvious as possible to minimize daily stress and anxiety for residents.
- Use wayfinding elements not only to provide directions for moving around a facility but also to prevent access to restricted or hazardous areas.
- Do not place repetitive elements such as lighting fixtures or carpet patterns in long corridors.
- Incorporate both single and double loaded corridors to break up repetitive corridors (see figure 84).
- Incorporate different colors or other recognizable local elements to help residents find their way.
- Design the ends of hallways as cul-de-sacs to contain wandering (see figure 85).
- See the following section, *Visual Cues*, for more wayfinding suggestions.



Single Loaded Corridor helps break up the repetitious rooms by linking the rooms with the outside environment.



Double Loaded Corridor can often create confusion with the repetitious rooms.

Figure 84: Above are two examples of corridor designs. A single loaded corridor connected to the outside can be wider for easier navigation and can help residents find their way by allowing more natural light into the facility.

Source: Author

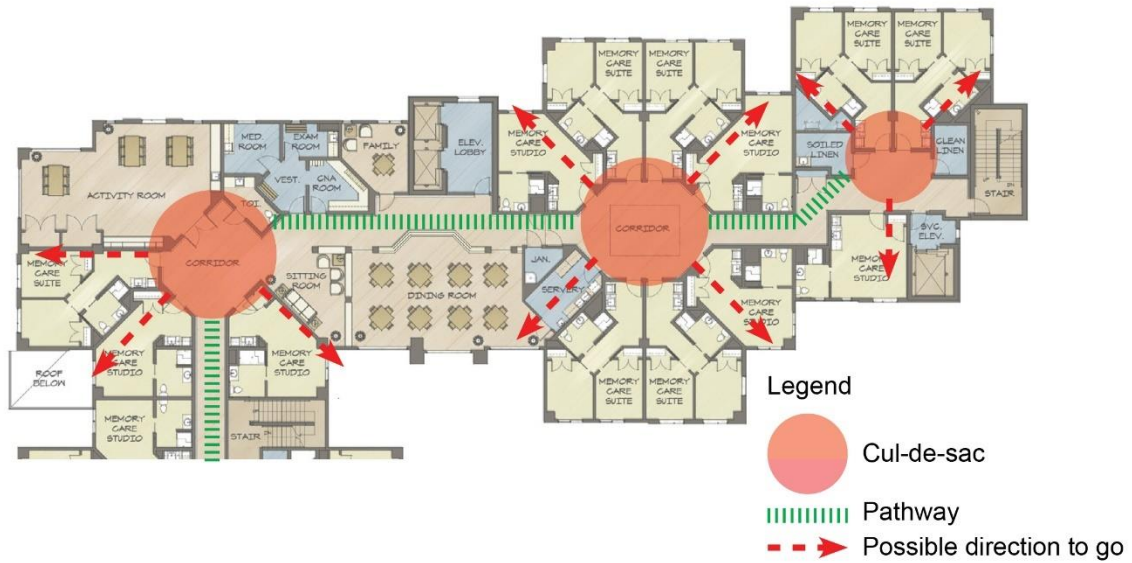


Figure 85: The Plaza Assisted Living facilities utilize cul-de-sacs or a room cluster design to help create a more neighborly environment. The looped handrails in the hallways provide a path for residents to wander along safely.

Source: Author

Visual Cues

Introduction

Visual cues are one of the key components that can help Dementia Care Facility residents navigate spaces and activities. Visual cues do not have to be complicated. An example of an effective visual cue is a sign with both illustration and text. Visual cues are beneficial in areas where an explanation is needed in order for something to work.

Guidelines

- Place a nameplate, shadowbox, or pinup board on each resident's bedroom door (see figure 86).
- Provide wall space for residents' pictures or artwork created while at the facility. Artwork in the hallways can help residents orient themselves.
- Colors and textures can be used to help guide residents throughout a facility.
- Keep visual cues simple to understand and follow (see figure 87).
- Contrast visual cues with the environment.
- Use familiar or recognizable symbols or shapes when designing visual cues (see figure 88).
- Along with text, pictures, and color, include visual cues in Braille.
- The facility should also consider printing additional placards in the languages of the surrounding community and of its residents and their families. In Hawai'i, these might include Hawaiian, Polynesian languages, Filipino, Japanese, Chinese, or Korean.

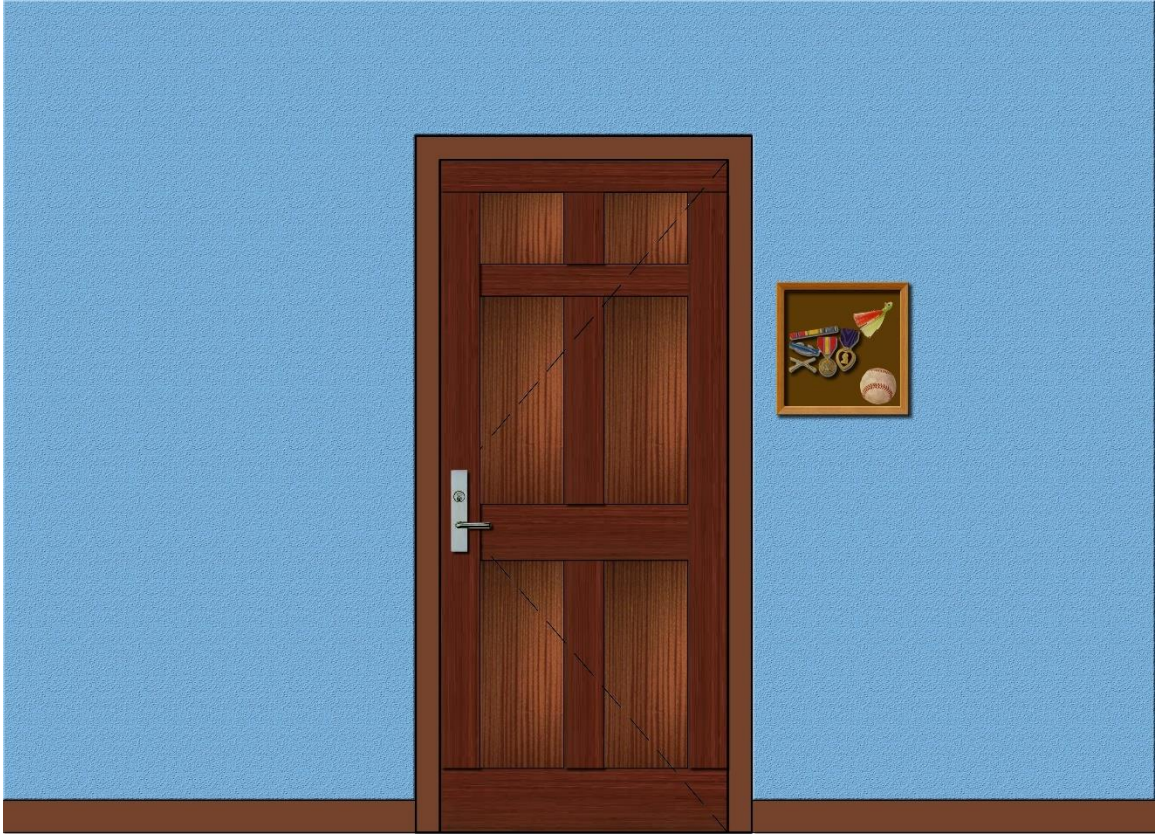


Figure 86: A visual cue can be as simple as a shadowbox next to a bedroom door. When creating a shadowbox, make sure it does not protrude more than 5 inches from the wall to keep it from being a hazard to passersby.

Source: Author

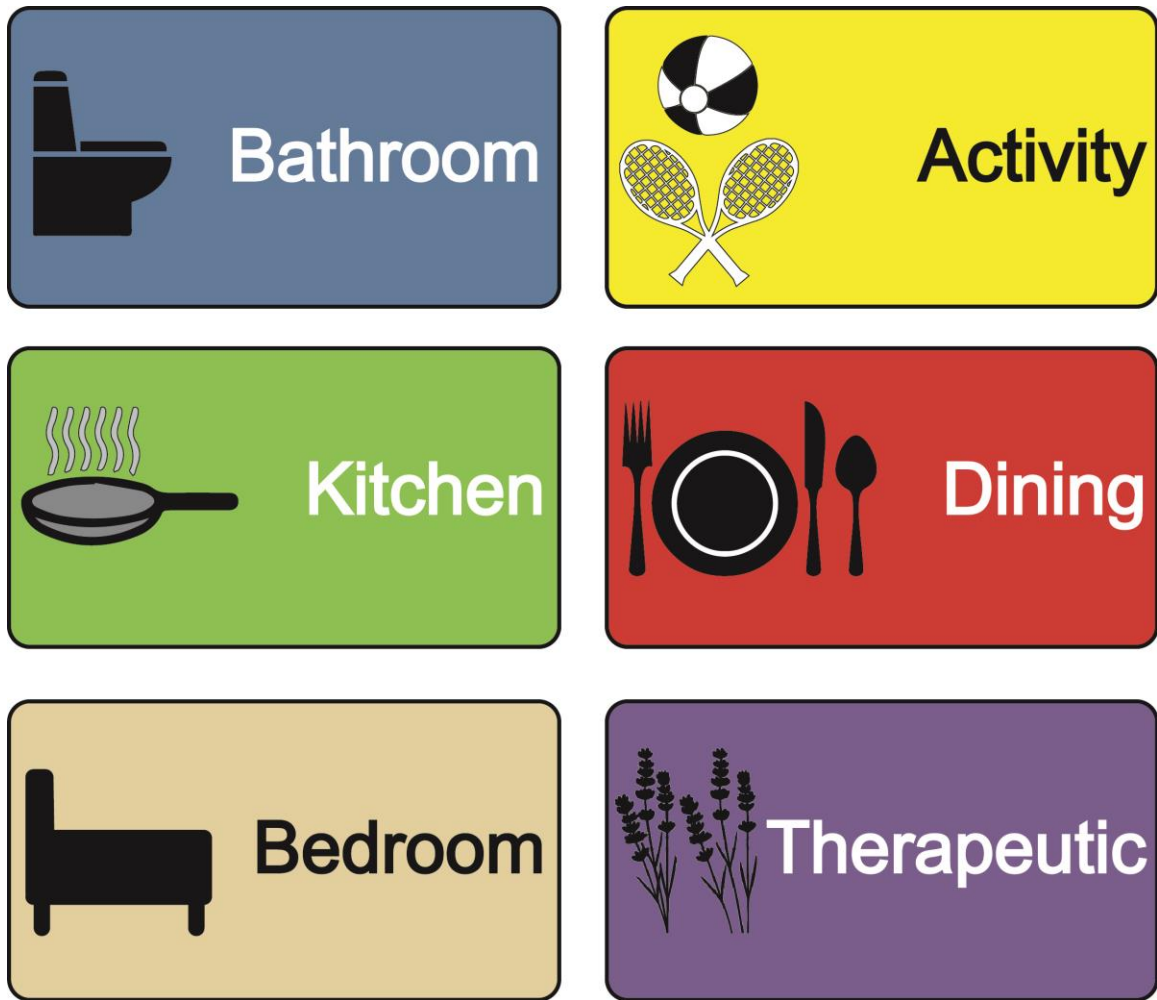


Figure 87: Simple placard signs that illustrate clear text, a symbol, and a color can help residents find their way throughout the facility.

Source: Author



Figure 88: Hawai'i streets signs are another type of visual cue that many local residents may recognize. Placing these types of signs in the hallways may assist residents in navigating the facility.

Source: Author

Signage

Introduction

Signage is important in a Dementia Care Facility. The ADA now requires that placards be placed in designated public spaces to indicate the room or area. These signs can provide further navigation assistance to residents. The following, taken from Elizabeth Brawley's book, *Designing for Alzheimer's Disease*, are the ADA-specified guidelines for signage (see figure 89).

Guidelines

- Lettering: Raised letters and numbers accompanied with Grade 2 Braille.
- Contrast: The color(s) of the text must contrast the color(s) of the background.
- Height: There should be sixty inches from the finished floor to the centerline of the sign.
- Location: Signs must be placed adjacent to the latch side of the door and two to three inches away from jamb.
- Width-to-Height Ratio: The letters on the sign must either be a 1:1 ratio or a 3:5 ratio.²¹⁶

²¹⁶Brawley, Elizabeth C. 1997. *Designing for Alzheimer's Disease*. New York: John Wiley & Sons, Inc. 153.

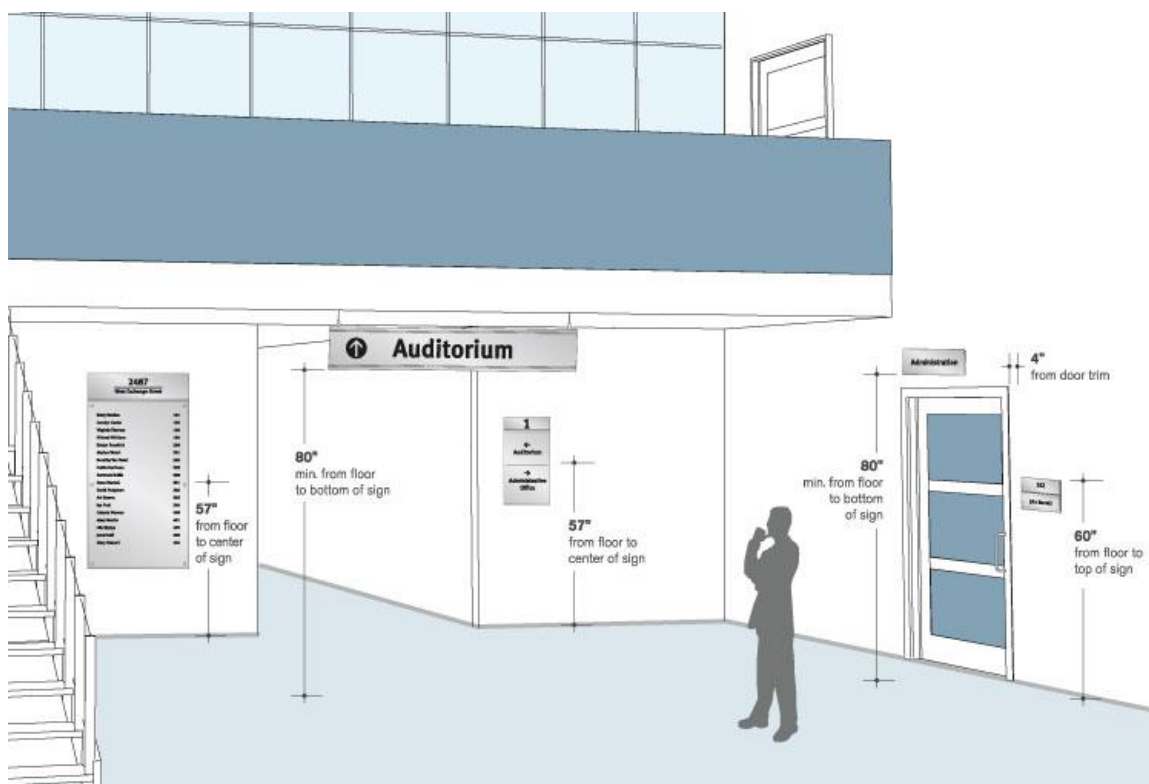


Figure 89: Signage made according to ADA height and location specifications.²¹⁷

²¹⁷ Takeform. 2016. Resources. Accessed February 22, 2016.
http://www.takeform.net/ADA_guides.php.

Spatial Layout

Introduction

When designing a Dementia Care Facility with a homelike approach, the floor layout is important. Access between rooms should be direct with the fewest possible walls. Will Perkins, an architect and gerontologist, recommends a “racetrack” style floor plan, which clusters rooms together and minimizes the amount of walls necessary. This floor plan situates the nurses’ station in a centralized area allowing for quicker response times.

Guidelines

- The overall floor plan should resemble a racetrack in form.
- Situate the kitchen, the focal point of the facility, in the center of the racetrack.
- Position the bedrooms along the perimeter of the facility, on the outside of the track. This connects them to natural ventilation and light (see figure 90).
- The building core and utilities should be integrated within the facility in a way that feels natural. For example, the Plazas built their lobby around the elevator core, a block secured from the rest of the facility, thereby preventing residents from wandering out of the front door and off property (see figure 91).
- Minimize the amount of corners and hidden spaces throughout the facility.
- Place the nurses’ station in a centralized area to reduce the travel time for nurses responding to residents in need.
- Incorporate nooks in areas that offer pleasant views, such as a view of the wandering garden or the city in the distance.

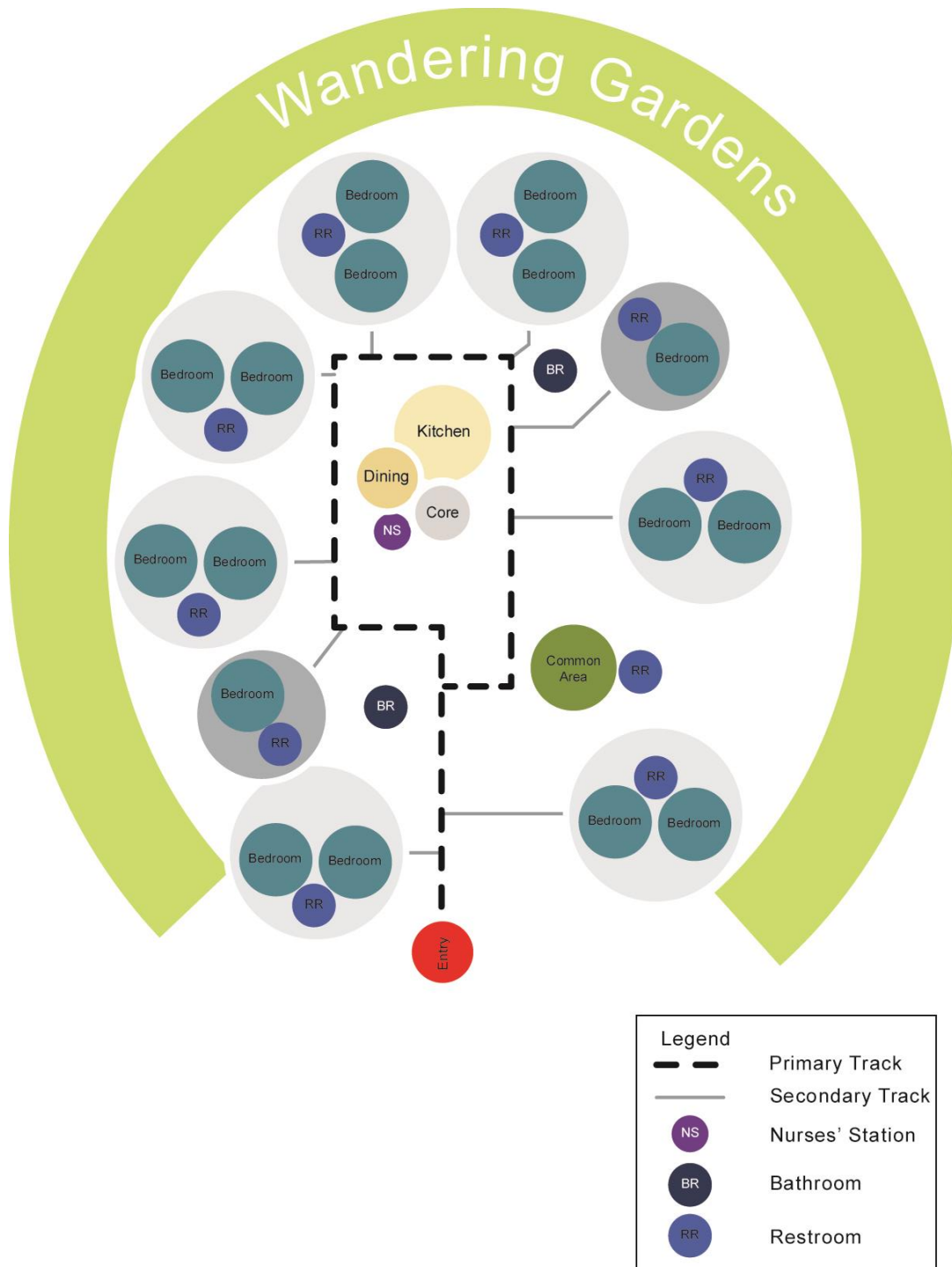


Figure 90: The bold dashed lines form the shape of a racetrack, an example of Will Perkins' recommendation. This method is more efficient because it reduces travel distances and provides a larger open floor plan.

Source: Author



Figure 91: The Plaza Assisted Living at Moanalua uses a secured elevator lobby to prevent residents from wandering off the property.

Source: Author

Interior Furniture

Introduction

As mentioned earlier, furniture can help break down larger spaces. A Dementia Care Facility should have two types of furniture: the furniture provided by the facility and furniture brought in by the residents. The furniture provided by the facility should correspond to its environment—dining chairs in the dining room; robust, moveable chairs in the activity room; beds and dressers in the bedroom; and so on. The furniture the residents bring with them from their homes is important in establishing a sense of place during the transitional process. Personal furniture can provide an agitated resident with something recognizable, something to grasp, in the midst of a mostly unfamiliar environment. The facility should do its best to respect the wishes of the residents and families, and offer options for different types of furniture allowed. Larger furniture pieces, such as couches, may be discouraged, but all cases should be considered case-by-case.

Guidelines

- Provide a variety of sizes and styles of furniture in public spaces.
- Chairs should have armrests that do not extend past the edge of the seat.
- Furniture should be firm—not too soft or deep.
- Seat heights should range between 17 and 19 ½ inches (see figure 92).
- Ensure furniture edges are blunt or rounded. Avoid furniture with sharp edges.
- Furniture colors should contrast with floor and wall colors (see figure 93).
- Select furniture that provides proper back support and keeps the user upright (see figure 94).
- Choose fabrics that provide extra protection from stains and tears and are easy to clean, without sacrificing the design or pattern.
- Use proper rubber or felt feet to prevent slippage. Chairs should not be able to slip away from the residents.

- Tables in the dining area should accommodate no more than four and tables in the activity room, no more than two, to minimize agitation or anxiety.

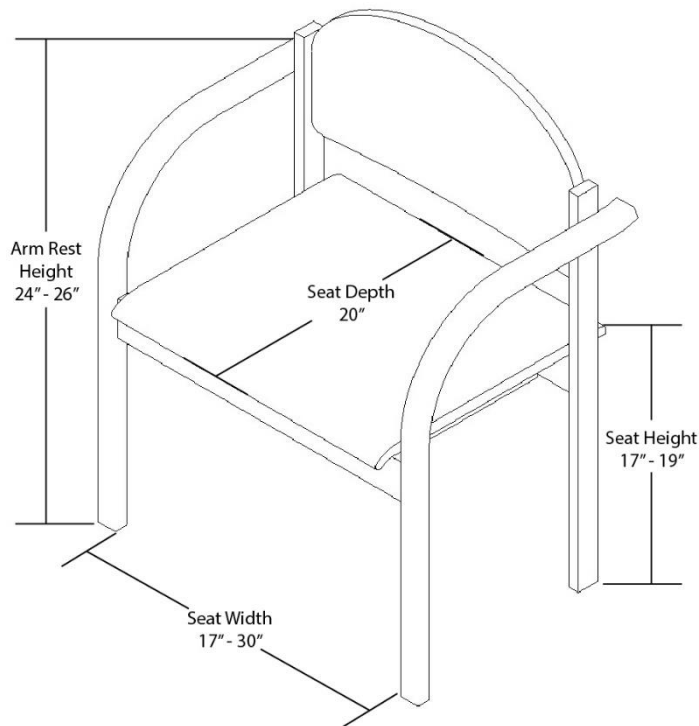


Figure 92: The recommended dimensions of a chair.

Source: Author



Figure 93: A table and chairs with a dark stain finish that contrasts with the floor.²¹⁸

²¹⁸ Berner, Linda. 2015. Accessed December 25, 2015. <http://lindaberner.com/round-pedestal-dining-table/saving-small-dining-room-spaces-with-36-inch-solid-wood-round-pedestal-dining-table-with-flower-centerpieces-and-4-dining-chairs-on-white-carpet-tiles/>.

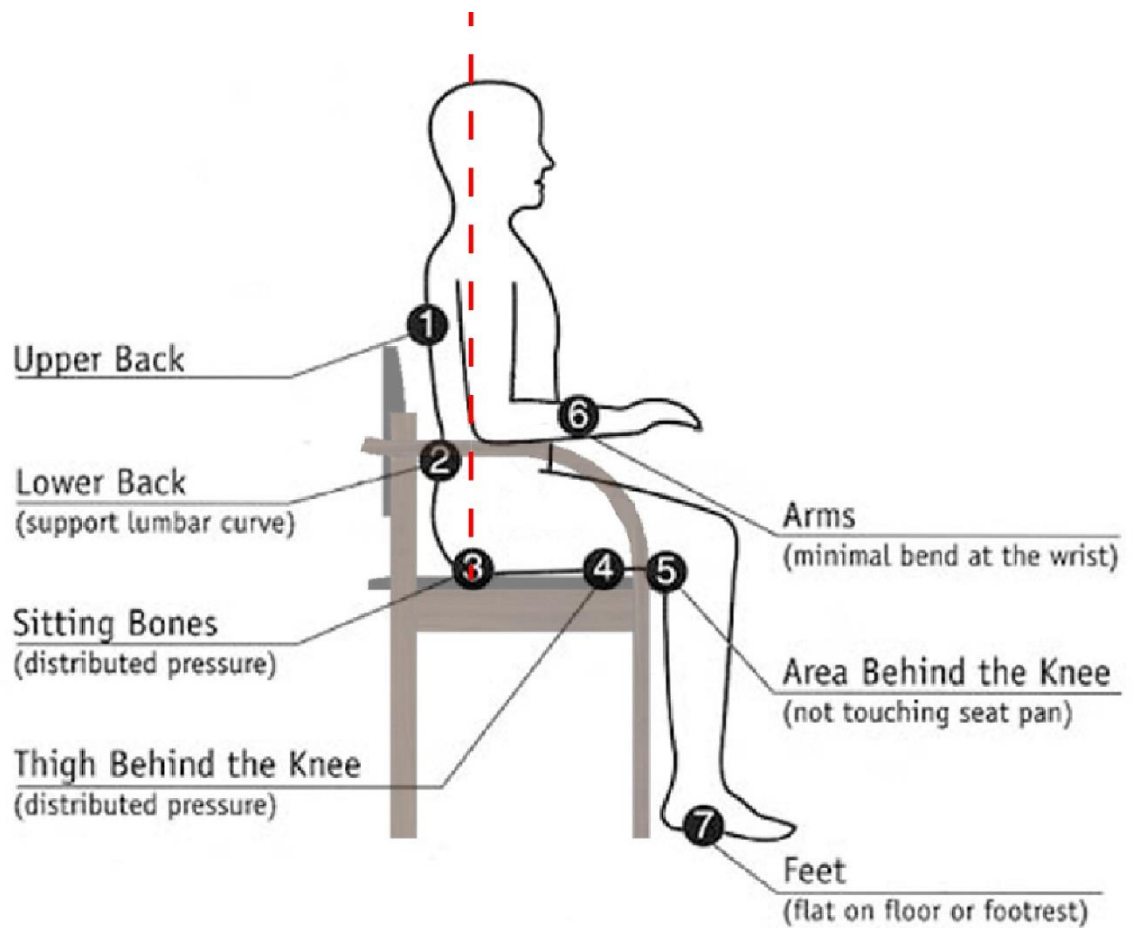


Figure 94: Illustration showing recommended chair elements; feet should rest firmly on the floor and arms should rest comfortably on the armrest.

Source: Author

Indoor Safety and Security

Introduction

The indoor security measures often used in Dementia Care Facilities can feel institutional and cold. Because of the number of federal, state, and local regulations that exist, facilities often follow the minimum requirements necessary to ensure the safety of both the staff and residents. Safety is a major liability issue in a care facility.

Safety and security covers a wide range of precautions from hazardous substances to possible fall accidents. The following sections will give more in-depth explanations for this aspect of facility design.

Guidelines

- To keep track of the whereabouts of the residents in a less conspicuous manner, implement different types of available security systems, including ultrasonic motion detectors, pressure mats, passive infrared photoelectric sensors, and switch sensors (see figure 95).
- All security systems should be hardwired to both the building and to the backup generator system.
- Minimize the use of closed-circuit televisions (CCTVs) in residents' rooms as they often feel too institutional.
- All restricted areas should be locked with a keypad or a physical key lock.
- Flooring materials should be slip resistant. The finish should also be a matte finish to minimize glare.

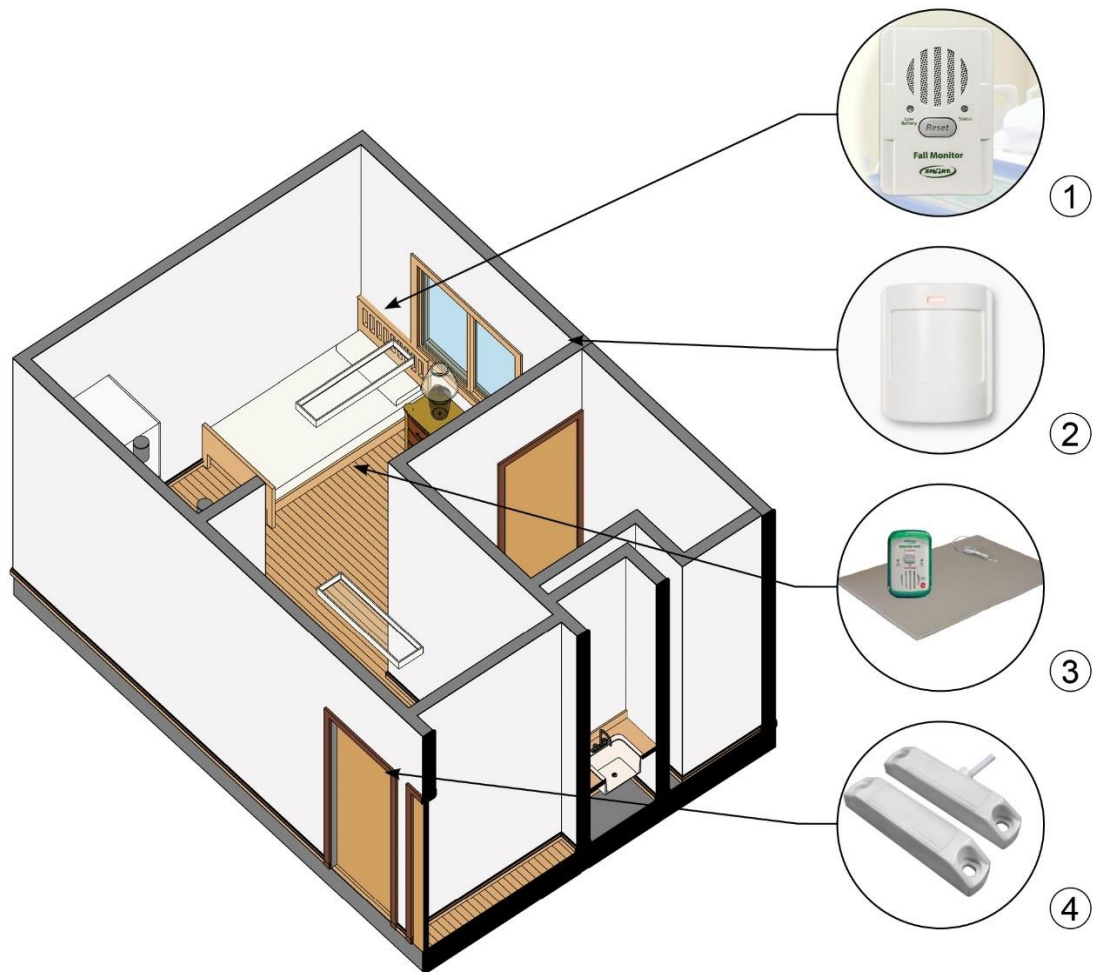


Figure 95: Examples of inconspicuous security systems that can be implemented in resident bedrooms: 1) a PA System that is connected to the nurses' station; 2) a miniature motion sensor that notifies the nurses if the resident is trying to wander; 3) a pressure mat that is wired to the nurses' station, which also disguises as a regular mat underneath; and 4) a silent door sensor that alerts the nurses if a resident tries to wander.

Elopement

Introduction

Elopement, or wandering, can occur during various stages of dementia. Elopement is a coping mechanism older adults use to try to orient themselves when they feel confused, anxious, or agitated. Elopement is a common behavioral issue that can cause great risk for residents and is a liability issue for healthcare providers.

Guidelines

- Because residents who wander also have a hard time deciphering colors, disguising the exits is a generally effective way to keep them from being discovered.
- The Hale Ku'ike, another local Dementia Care Facility, uses a locking system where a silent alarm will trigger 15 seconds after the door is opened. The user has that amount of time to punch in the correct disarming code.
- Provide a safe environment in which residents can wander, an important feature of any facility. Wandering along secure hallways can help residents cope with anxiety and agitation (see figure 96).



Figure 96: The Plaza Assisted Living at Moanalua provides a secure area on the memory care floor where residents can wander freely.

Source: Author

Windows

Introduction

Windows are an important feature in a care facility. Allowing natural daylight into a room reduces the number of lights required during the day. Windows also provide a view of and connection to the outdoors, which can help stimulate the residents' senses. Windows, however, create a set of challenges. If not properly addressed, windows can increase the glare in a room. Also, a bad fitment of a window can create a broken building envelope, allowing cold or warm air to escape the building, depending on the season.

Guidelines

- Use double- or triple-pane windows, which perform better than single-pane windows.
- Install some sort of operable curtain or blinds on each window to help reduce the noise vibrations and glare.
- Limit the ability of windows to open to a maximum of 6 inches. Natural air can still enter the building, but this prevents a resident from falling or getting stuck in the window if attempting to end his or her life.

Daylighting

Introduction

In many existing long-term care facilities, natural light is not a priority. However, incorporating daylighting into a Dementia Care Facility is beneficial on many levels. Daylighting reduces the amount of electrical light fixtures needed, thereby lowering overall building energy use and cost. It also brings natural warmth into any room. Daylighting can play a major role in a resident's personal comfort and can also prevent or reduce sundowning in residents with Alzheimer's disease.

Guidelines

- Use software programs such as DIVA for Rhino, Ecotect, and Lighting Analysis for Revit, Revit, and Revit Architecture to simulate light entering a building before it is built.
- Use the LEED EQc8.1, a checklist created by the United States Green Building Council (USGBC) that helps architects create designs that provide a good connection between indoor and outdoor spaces.
- Daylighting can create direct glare, so shield or diffuse the light to create an even exposure in the room.
- Incorporate skylights or light tubes in hallways or large public gathering spaces to help bring natural light to places farther away from the windows (see figure 97).
- Light shelves are another element that can be added to help diffuse sunlight deeper into a room.
- All bedrooms should be able to let in natural light.
- Design high ceilings and tall windows in larger public spaces to allow more light to enter the room. The ratio of light entering a building is 1:2. For example, if the room height is 8 feet, the farthest the light can reach into the room is roughly 16 feet (see figure 98).



Figure 97: A skylight can flood a room with indirect light creating less glare than a regular window.²¹⁹

²¹⁹ Windy City Skylights. 2016. Residential Skylight. Accessed January 14, 2016. <http://www.windycityskylights.com/skylights/residential/>.

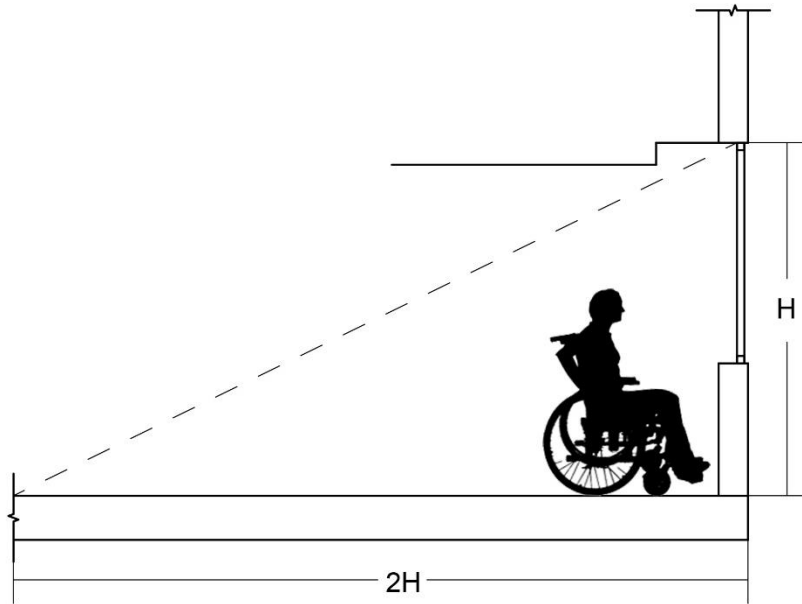


Figure 98: To create proper daylighting, the ceiling must be set above the dashed line.

Source: Author

Interior Doors

Introduction

Doors provide both access and security in a Dementia Care Facility. Several different doors should be included in the facility's design. Doors can help make a facility feel either institutional or homelike. The typical hospital door, cold gray or white with a small glass privacy slit, can make anyone feel depressed.

Guideline

- Doors within a facility should be one-hour fire-rated residential doors.
- Doors should be at least 36 inches wide for handicap accessibility.
- Bedroom doors should have a wood finish rather than a solid painted finish.
- BOH doors can be standard metal-skinned fire-rated doors.
- Install padlock, key, or security card locks on facility doors.
- Exterior doors should either be automatic or have a handicap door activation switch.
- Shower room and restroom doors should be 42 inches wide for easier access.
- Choose doors to match the rooms (see figure 99).
- Glass accordion doors can provide a semi-private area for agitated residents while still allowing residents to visually participate in activities (see figure 100).
- Doors should have a push resistance of no more than 5 pounds.
- Place automatic doors at the entrance of the facility.
- All door handles should be levers rather than knobs, making doors easier to open for those with arthritis (see figure 101).



Fire rated wood doors for residents bedroom. These doors offer 1-hour fire rating.



These fire rated doors can be used in common or public areas. These door offer 1-hour fire rating.

Figure 99: ¹²²⁰) These doors are ideal for residents because they offer both safety and a homelike appeal. ²²¹) This double door is ideal for semi-private resident rooms. ³²²) These doors may feel institutional, but can be used in restricted-access BOH areas. ⁴²²³) This typical double door can be used in areas that link outdoor and indoor spaces.

²²⁰ Design, Interior & Exterior Doors. 2015. Fire rated wood doors Photo – 11. Accessed February 9, 2016. <http://freera.org/fire-rated-wood-doors.html/fire-rated-wood-doors-photo-11>.

²²¹ SAT Industries LLC. 2016. Fire Rated & Non Fire Rated Wood Doors. Accessed February 9, 2016. <http://satindustries.net/fire Rated and non fire ratedwood doors.php>.

²²² TruDoor. 2016. Commercial Hollow Metal Doors. Accessed February 9, 2016. <http://www.trudoor.com/commercial-hollow-metal-doors>.

²²³ Marvin Doors. 2016. Marvin Commercial Door. Accessed February 9, 2016. <http://www.marvin.com/marvin/doors/commercial>.

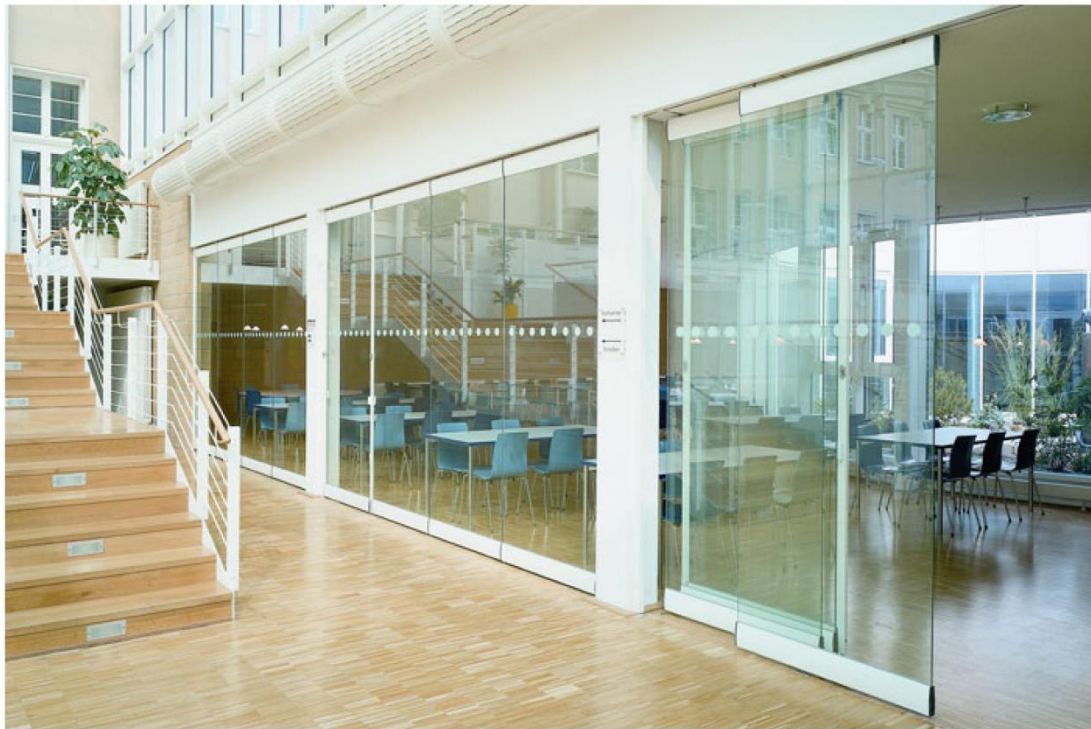


Figure 100: ModernFold Acousti-Clear²²⁴ glass is a glass partition that comes with acoustical properties. This product would be great for a care facility where because it provides acoustic control while allowing agitated residents to see the activities within.

²²⁴ Modernfold. 2016. Modernfold Acousti-Clear Glass Wall Partitions. Accessed February 9, 2016. <https://www.modernfoldstyles.com/project/acousti-clear/>.

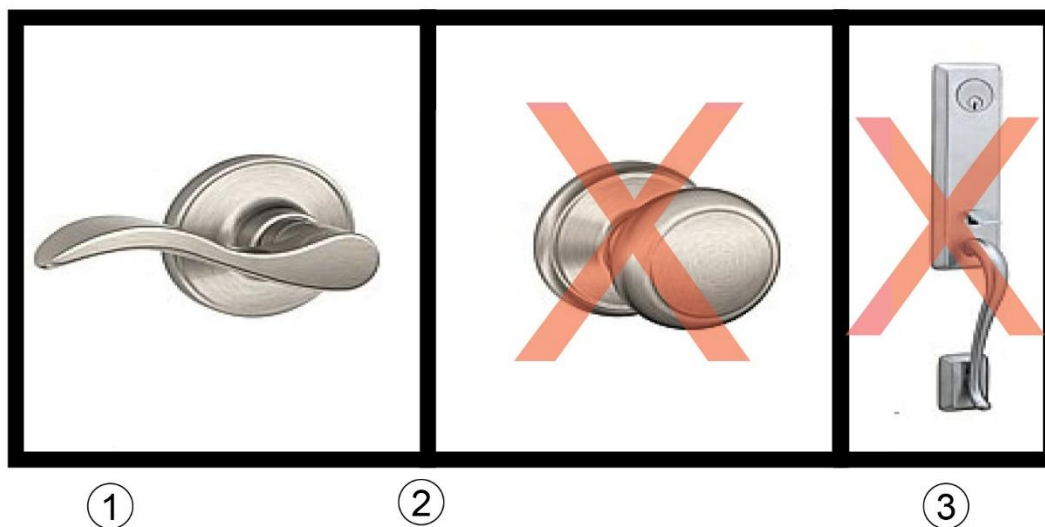


Figure 101: Example 1 is an ideal door handle for residents with arthritis because it requires less hand movement and dexterity to operate. Avoid examples two and three; both are difficult for arthritic hands to operate and can be a source of daily anxiety for res²²⁵

²²⁵ About Home. 2012. Choosing the Right Type of Door Knob and Lock. Accessed February 21, 2016. <http://homerepair.about.com/od/interiorhomerepair/ss/Choosing-The-Right-Type-Of-Door-Knob-And-Lock-Set.htm>.

Summary

The goal of this project is to help bring awareness to the people of Hawai'i of the changes needed in its care facilities in the near future. Hawai'i, along with the rest of the world, is expected to feel the impacts of a rapidly growing population of older adults within the next decade as the large baby boom generation reaches retirement age. Furthermore, it is predicted that by the year 2025, one in three Americans age 65 and older will be diagnosed with Alzheimer's disease.²²⁶

The Alzheimer's Association, in "2015 Alzheimer's Disease Facts and Figures," reports that in the year 2015 an estimated 26,000 people age 65 and older in Hawai'i already have or were diagnosed with Alzheimer's disease and by 2035, 35,000 people age 65 and older are predicted to either have or be diagnosed with Alzheimer's disease—a 35 percent increase in twenty years.²²⁷ In 2014, there were approximately 4,213 beds dedicated to Alzheimer's Special Care Units in Hawai'i.²²⁸ In the coming decade, commercial facilities including ALFs, SNFs, CCRCs, and long-term nursing facilities are expected to experience a serious influx of older adults with Alzheimer's and dementia.

Although the author does not have a medical background or professional experience, he did go through an increasingly common experience: placing a loved one into a secured nursing facility. The experience was emotional and humbling. Until his grandfather was placed in a facility, he had never put much thought into the nursing home environment. The author's grandfather was still living at an SNF when he passed away. This experiences provided the motivation

²²⁶ Alzheimer's Association. "2015 Alzheimer's Disease Facts and Figures." 2015. Accessed February 25, 2016.
https://www.alz.org/facts/downloads/facts_figures_2015.pdf. 24.

²²⁷ Ibid., 19.

²²⁸ Ibid., 52.

and drive the author needed to assemble guidelines that identify the ways a secured facility can be more homelike, welcoming, and respectful.

This project is not just about examining the skilled nursing environment; the topics covered focus on existing issues in the quality of care within Hawai'i's current care system. The project covers several different disciplinary fields including public health and architecture, and touches on psychology. Although the architectural aspect was the focus, all the information presented provides recommendations and solutions for bettering Alzheimer's disease and dementia care in Hawai'i's nursing facilities.

The creation of SCUs or Dementia Care Facilities that follow proper design guidelines will improve the overall existing quality of care in Hawai'i. The lack of State initiative to establish a standard has truly dampened the potential for better quality of care. Much research has been and continues to be conducted by universities, the medical field, and the Alzheimer's Association to find a cure and to better understand the disease. However, until the cure is found, and as the population of older adults rapidly grows, it is becoming increasingly necessary to reconsider the way SCUs and Dementia Care Facilities are designed.

As iterated in the Summary to Part 1, Hawai'i's legislature has made no concrete moves to prepare for the predicted influx of older adults with dementia. Moreover, neither Hawai'i nor many other states have a delineated basis of design (BOD) for dementia care.

The guidelines presented here by no means replace existing design considerations and theories that healthcare professionals practice today. These guidelines, rather, were designed to help architects, designers, or any caretaker of someone living with dementia, to make better, more informed design decisions. They are a compilation of design considerations tested by gerontologists across the country over the past twenty years. As stated earlier, these guidelines address the general population of those with Alzheimer's disease or dementia, reflecting common elements discovered across many studies, but may not work with every individual as each person's circumstances and experiences differ.

Many design solutions addressing the quality of care for older adults with dementia that may be effective on the mainland, are not possible in Hawai'i, largely due to land space restrictions. For example, the ideal design for a dementia care facility is a single story facility that offers only private rooms. On the mainland, this solution can work in many places because of the availability and affordability of land. In Hawai'i, this is not possible. Another aspect that limits the building of care facilities in Hawai'i is the cost. Both soft and hard costs are greater in Hawai'i than in many states. The cost of running a facility is often the driver behind many design decisions.

Before establishing building guidelines, this project reviewed information and current research on how Alzheimer's disease affects older adults, what its known triggers are, and what non-drug methods can help older adults cope. Through the research process, it became evident that many of the architectural features that many gerontologists recommend are simple gestures that have a huge impact on the daily existence of those with dementia. For example, properly laying out furniture in the living room or choosing appropriate colors and patterns in the dining room, both simple aspects of the design, can either add ease, warmth, and quiet comfort to daily life or provoke repeated frustration and anxiety in the residents' lives.

These guidelines focus on the psychological and nursing aspect of a care facility rather than the cost. Every design decision that an architect makes when creating a Dementia Care Facility can greatly affect the lives of the residents, either helping them to cope or worsening their dementia. For each design guideline considered, the author checked whether it was effective and appropriate for building and for life in Hawai'i. To do this, the author relied on the existing built environment and incorporated methods that have been successfully tested and implemented in facilities across the country.

One of the central goals of creating these guidelines was to ensure that the dignity of the residents is maintained at all times and that their needs, beyond just the physical, are properly addressed. Another chief goal was to develop the idea of a homelike environment in a care facility. The homelike approach

provides a gentler, kinder environment for the residents and initially, offers common ground to those transitioning from home. The earlier an older adult with Alzheimer's disease can transfer from home to a facility, the less difficult the transition will most likely be. Ideally, families will consider moving their loved ones to a facility when they are going through the third or fourth stage of Alzheimer's. During stages five through seven, older adults may find it much more difficult to transition and often times will lash out in anger from confusion. By incorporating homelike characteristics into the design, older adults with severe Alzheimer's disease may have a better chance of successfully transitioning.

Creating a secured facility that only addresses the physical and security needs of older adults with Alzheimer's disease might be simpler and initially more cost-effective. However, the results would be devastating with a high death toll because the residents would not be able to adapt on any level. Hawai'i is a culturally diverse state and the home is more than just a structure. It is a universally recognizable symbol. An environment filled with cues that are familiar will help older adults transition and adapt to their new home.

So where do we go from here? The first step in establishing State guidelines for designing facilities that support dementia care is to educate the public. The Alzheimer's Association has been working tirelessly and effectively to educate the general population about the disease, but still it is not enough. Communities, individual residents, and other groups and organizations must work together to help create the change. Education and training should also be taught to younger adults in school. Involving the younger generations can help generate a greater momentum for change.

Architects and designers should receive training in these fields. The Alzheimer's Association along with other dementia associations can conduct training sessions through the AIA as Continuing Education (CE). Architects and designers need to understand not only that current design methodologies do not always work and may indeed have the opposite effect, but also the reasons why.

Next, existing facilities must adapt these guidelines. This may require some financial help and incentive from the legislature.

Finally, in order to achieve the goal of establishing these guidelines at the state level, the government must get involved. Local, state, and federal governments must begin to take this topic seriously. If dementia care units or facilities are not built properly, many residents will suffer unnecessarily.

Greater media coverage of the changes needed in Hawai'i's care system will help curb the misconception and misinformation that can negatively affect older adults while also helping to educate the public on this growing issue. By now, the State should recognize that the large population expected to have Alzheimer's Disease in the very near future can create a significant burden on the State and can potentially negatively affect a significant number of its residents, if it does not take steps now to ameliorate the situation.

The realization of this project, from the research to the creation of Hawai'i standards for building Dementia Care Facilities, needs to be advocated by the local community first. It is with the help of our communities that this project can truly be realized and become more than a dissertation.

Checklist of Guidelines

Homelike Integration

Entry

- ✓ In the entry area, showcase *why* the facility exists, *who* the facility's staff and residents are, and *what* beliefs the facility represents.
- ✓ The entryway should not feel crowded or cramped but rather open, free-flowing, and safe.
- ✓ The entry should emanate the warmth of a home; the staff should present a friendly environment; and most importantly, the space should have a welcoming spirit. In Hawai'i there is a certain "Aloha" or welcoming feeling you get when entering a new environment.
- ✓ The entry should have a large opening that leads the residents, families, and visitors to either the heart of the facility or another significant feature. A good example of this is Kahala Nui: the lobby showcases an open courtyard that has both outdoor seating and a water feature.

Living Room

- ✓ The living room should be a node in the building that leads to other parts of the building.
- ✓ Ensure the paths leading to other parts of the building are distinguished and clear.
- ✓ It is important to remember when designing the living room that it is an important node, but not the primary node around which everything revolves.
- ✓ Use furniture to break down a large room into smaller zones in which residents can engage.

Dining Room

- ✓ The dining room should be a simple and attractive space that is a size and scale older adults can compute and should not resemble a cafeteria.
- ✓ Tables in the dining room should seat no more than four.
- ✓ An ideal table size is 50 inches by 50 inches.
- ✓ Set the dining room near the kitchen so that travel between the kitchen and dining area is short for staff members.
- ✓ Install photodetectors or photo sensors to maintain the brightness of the room.
- ✓ The minimum light level in a dining area should be 50 foot-candles.
- ✓ Incorporate reds and yellows, which can encourage eating; avoid yellow-greens and blues, which can discourage eating.
- ✓ Keep patterns in the room, such as those on the tablecloths, simple.
- ✓ When choosing furniture and its layout, provide enough space to ensure that all parts of the room are wheelchair-accessible.

Kitchen

- ✓ The kitchen is the most important room in a Dementia Care Facility. Kitchens are familiar to most residents, can stimulate many senses at once, and can provide a feeling of living in a care home rather than in an institution.
- ✓ Many of the items in the kitchen are potentially dangerous. Glassware, knives, sharp utensils, and other such items should be closely monitored when residents are helping in the kitchen.
- ✓ Install induction stoves for use in the kitchen. Induction stoves are safer and more efficient than traditional stoves and ranges.
- ✓ Ensure that the kitchen design can accommodate residents who are handicapped.
- ✓ Kitchen sinks should conform to the 2010 ADAAG standards for accessibility.

- ✓ Set the upper wall cabinets low enough that a person in a wheelchair can access the items within.
- ✓ If residents will only be assisting the sous chef, then the main design features to incorporate involve designating enough floor space for maneuverability and under-cabinet space for wheelchairs.
- ✓ Design the layout to provide a homelike feeling yet still be a complete and functional kitchen for staff members.
- ✓ Use direct lighting over areas where prepping and cooking will occur.
- ✓ Determine kitchen acoustics based on the room's layout.
- ✓ Use type X Gypsum wallboard on the walls and ceiling.

Bedroom

- ✓ Choose a homelike palette and texture for bedroom walls.
- ✓ Ideally, around 220 square feet should be allotted per resident for personal space and belongings.
- ✓ The bedroom space should also be able to accommodate machines such as ventilators, tracheostomy tubes, tube feeders, and wheelchairs.
- ✓ Allow residents to bring in some small items of furniture and other belongings from their homes.
- ✓ Provide sufficient storage space within each resident's room.
- ✓ If throw rugs are an option, ensure that the floors provide enough resistance to prevent rug slippage.
- ✓ Each bedroom should have an accessible, useable window, either sliding or hung. Also, safety measures should be established to prevent residents from climbing up or falling out of the windows. See the Windows section for more information.

Restroom

- ✓ The transition into the restroom and shower room should be seamless. If there is a transitional sill, it must not exceed a quarter of an inch for wheelchair access.

- ✓ ADAAG requires that restroom and shower room doors have a minimum opening of 36 inches. A 42-inch opening, however, is more suitable and comfortable.
- ✓ Countertops should be 34 inches tall for wheelchair access.
- ✓ Install countertops and faucets with a matte-finish. Satin, nickel, and bronze are also acceptable choices; chrome is not acceptable.
- ✓ Contrast countertop materials with the walls.
- ✓ Ensure that water temperature is regulated and not able to exceed 110 degrees Fahrenheit.
- ✓ Design a 5-foot turn-around space inside the restroom to provide wheelchair maneuverability (see figure 55).
- ✓ Install at least two Ground Fault Circuit Interrupters (GFCI) no higher than 48 inches from the finished floor in each restroom and shower room.
- ✓ Toilets or water closets should be no taller than 18 inches.
- ✓ Allocate a maximum of six residents per restroom and twelve per shower room.

Shower Room

- ✓ The shower room dimensions should be roughly 10 feet by 10 feet. This provides enough space for nurses to maneuver residents who may be wheelchair bound in the shower stall.
- ✓ The doorway should be at least 36-inches wide.
- ✓ Ensure that each shower room in the facility has a walk-in tub as well as a curb-less shower pan. Ideally, the entire shower room floor is the shower pan that gently slopes toward a central drain.
- ✓ The shower room should provide options to residents: walk-in tubs allow residents to bathe on their own terms.
- ✓ Place grab bars in strategic locations mainly around the inside and outside walls of the shower.
- ✓ Ensure that water temperature is regulated and not able to exceed 110 degrees Fahrenheit.

- ✓ Place a built-in or collapsible shower chair inside the shower. A shower chair can also be used in the bath.
- ✓ The showerhead should be adjustable. Residents may have varied preferences for the height of the showerhead. Newer adjustable showerheads also come with a grab bar.
- ✓ Slip resistant flooring material should be used in the shower room. Ceramic tiles or smooth quarry tiles are acceptable as long as they provide a gritty surface that is slip resistant.
- ✓ The walls and floor should not be the same material and should contrast with each other.
- ✓ Indirect lighting should be used in the shower room to help minimize glare from the water on the floor or in the tub.

Therapeutic Room

- ✓ The Namaste room at the Manoa Cottages in Kaimuki has purple walls, which helps create a calming environment. Use calm colors, such as different shades of purple, for therapeutic rooms.
- ✓ Install wall-mounted flat screen monitors in the room that play looped videos of calming sensory scenes.
- ✓ The furniture in the room should consist of reclining massage chairs.
- ✓ The temperature in the room should be between 70 and 75 degrees Fahrenheit.
- ✓ Keep the acoustical decibel level between 30 and 45 decibels.
- ✓ Use indirect lighting with a dimmer switch.
- ✓ Use the room's dimensions to create a sense of intimacy rather than spaciousness. However, ensure the room is large enough to accommodate at least two reclining massage chairs.
- ✓ One possible location for therapeutic rooms, depending on the floor plan, is near the end of hallways to provide wandering residents with a destination point.

- ✓ Incorporate essential oil diffusers with calming scents such as lavender and chamomile.

Integration with Other Amenities

- ✓ Provide a space that allows family members to spend the night with love ones. This room should be similar in size to a hotel room.
- ✓ The beauty salon should be roughly 450 to 600 square feet and have space for 3 stylists.
- ✓ Due to federal regulations and the possible dangers of allowing residents to leave a facility to shop, incorporate a small shopping venue in the facility. The store should be similar to one you would find in a mall or shopping complex.
- ✓ Keep the mini store simple with a minimal amount of items and choices. Too many items may cause confusion, anxiety, or agitation.
- ✓ The store should be roughly 700 to 850 square feet. This allows for shelving as well as adequate space for wheelchair maneuverability.
- ✓ Incorporate a media stand or rack in a central place in the facility to give residents access to magazines and newspapers. This can be as simple as a niche in the wall with horizontal bars for newspapers and a table set aside for magazines.
- ✓ Set aside a medical room for visits from dentists or personal physicians.
- ✓ The medical room should be roughly 100 square feet.

Activity Room

- ✓ Situate the activity room along an exterior wall to allow natural light and air to enter the room freely.
- ✓ Attach a restroom to the activity room.
- ✓ Design ample storage space in the room for the different types of equipment and tools needed for the various activities.
- ✓ Use sheet vinyl flooring with a matte-finish and wood appearance to provide adequate grip and easy cleaning.

- ✓ Design the room acoustics to account for loud noises and also for storytelling, singing, and playing of instruments.
- ✓ Calculate the size of the activity room on a case-by-case basis. It should be able to accommodate about one-third of the facility's residents at a time.
- ✓ The activity room can be used as another destination point for residents who wander.

Back of House (BOH)

- ✓ Ensure the BOH components are secure and feature measures that prevent residents from gaining access, including specialized door locks.
- ✓ Hide the parking either behind the facility or underground because it may have a negative effect on some residents.
- ✓ Underground parking also allows the facility to have a larger wandering garden.

Exterior Guidelines

Neighborhood Approach

- ✓ Choose a neighborhood with a low crime rate.
- ✓ Situate the facility near a park or recreational area where residents and their families can picnic or stroll together during visits.
- ✓ Also situate the facility near a shopping complex or mall.
- ✓ Use trees to help control neighborhood noises.
- ✓ Ensure that outdoor acoustics range from 60 to 70 decibels.
- ✓ Vehicular traffic on adjacent roads should be mild to mid-moderate.
- ✓ Neighboring businesses should not be industrial.
- ✓ Create a friendly and inviting curb appeal.
- ✓ Set a clear path from the sidewalk to the front entrance.
- ✓ Parking should be accommodated within the facility design.
- ✓ The facility should be within walking distance of the community.

Site Orientation

- ✓ Use software programs such as DIVA for Rhino, Ecotect, and Lighting Analysis for Revit, Revit, and Revit Architecture to simulate light entering the building before it is built in order to make better, more sustainable design decisions.
- ✓ Situate the longest face of the building perpendicular to the prevailing winds.
- ✓ Understand the location and sources of noise around the site.
- ✓ Orient the building to hide or camouflage negative distractions such as parking lots and busy intersections.

Building Appearance

- ✓ Incorporate small roofs, exterior storm shutters, and other elements to help break down the scale of the building.

- ✓ Use exterior windows to help break up the overall height appearance of a building.
- ✓ Plant vegetation and install water features to help ease the connection between the building and site. Vegetation and trees can also hide parts of the building or facility that architects and designers do not want residents to see, such as cars or pedestrians entering and leaving the facility.
- ✓ Placing a porte-cochère at the entrance can help make the scale of the building more manageable for residents. This also provides protection from the weather for those entering and exiting a vehicle.
- ✓ Set the overall facility back from the entrance to help break down the scale of the building.
- ✓ Avoid using institutional colors for exterior paints. This includes whites and grays.
- ✓ Consider drawing inspiration from the site's surrounding context. Homelike integration for building appearance involves blending in with the environment, not standing out.

Outdoor Acoustics

- ✓ Ensure that the decibel levels stay between 60 and 70 decibels.
- ✓ Use plants and trees to help buffer unwanted noise.

Wandering Gardens or Therapeutic Gardens

- ✓ The pathway for a wandering garden or dementia garden should form a loop.
- ✓ Place multiple smaller wandering gardens or therapeutic gardens in different areas of the facility, if space allows. Small gardens can fit into smaller spaces and offer a more private experience.
- ✓ Include seating, a covered canopy, and tables where families can gather to spend time with their loved ones.
- ✓ The path width should be at least 7 feet to accommodate two wheelchairs passing each other.

- ✓ Keep the pathway clear of shrubs, plants, and trees to prevent any personal accidents.
- ✓ Incorporate benches with back rests into the landscape along the pathway for residents on foot to rest.
- ✓ Position shading canopies or trellises above the benches to minimize residents' sun exposure.
- ✓ Incorporate features such as birdfeeders, birdhouses, birdbaths, and plants that attract birds.
- ✓ All plants should be non-poisonous.
- ✓ For large outdoor areas, operable, retractable shade sails can be erected.

Rooftop Green Roof

- ✓ When space does not allow a garden on the facility property, a possible solution is a green roof, which can offer similar benefits to a ground level wandering garden.
- ✓ The parapet along the perimeter of the building should be set at an adequate height to prevent residents from falling over the edge.
- ✓ Conceal and secure any building utility units such as the cooling tower or any part of the HVAC system.
- ✓ If rooftop space is an issue, a possible solution is to build a smaller green roof and block off the HVAC units with a fence.

Ground Preparation

- ✓ It is important to pay attention to the texture of the paver. Even though it may be made of concrete or rock, it is a good idea to pour water onto the paver or tile to check its slippage.
- ✓ Pavers should interlock with one another.
- ✓ Paver textures should provide wayfinding assistance throughout the garden.

- ✓ A 5-foot diameter should be sufficient for a wheelchair to maneuver with ease.
- ✓ Slopes should not exceed 1:12.
- ✓ Place handrails along the pathway for assistance.

Outdoor Furniture

- ✓ Outdoor furniture materials should be made of wood or other rot-resistant materials.
- ✓ Outdoor furniture should not be reflective, and should have a low transfer of heat and a good life expectancy.
- ✓ Materials such as aluminum with vinyl, Trex®, and concrete are good choices for seating material.
- ✓ Seat height should be between 17 and 19 ½ inches tall.
- ✓ Outdoor furniture edges should be blunt or rounded. Avoid furniture with sharp edges.
- ✓ Outdoor furniture color should contrast with its environment.
- ✓ Choose furniture that provides proper back support and keeps the user upright.
- ✓ Place furniture strategically to provide resting places where the distance of travel may be long for the resident.

Outdoor Security and Safety

- ✓ The facility's perimeter should be secured with controlled access points.
- ✓ Use colors commonly associated with the specific area or room. For example, a garden will typically include colors such as red, green, yellow or blue.
- ✓ Minimize dead end space by designing the path in the shape of a loop.
- ✓ Gates, fences, and locks should be camouflaged to minimize attention.
- ✓ The height of the exterior fence should be at least 6 feet.
- ✓ Padlock or keycard locks should be used for exterior gates.

- ✓ Incorporate site components such as clusters of trees, trellises, raised planting beds, and pergolas to provide shade and to break up larger spaces.

Sensory Environment

Interior Acoustics

- ✓ Avoid large glass windows. Even though they allow a great amount of natural light into a room, they also allow in a great deal of outside noise.
- ✓ The placement of doors is important for noise control. Aligning doors across from each other causes sound to transfer directly from one room to the next while staggering doors may help buffer the transfer of noise.
- ✓ The use of niches with planters can help reduce unwanted noise. Both the niches and the softer surfaces of plants can help mitigate the transfer of noise.
- ✓ Allow the residents to have radios or music players in their rooms so they can choose the music they listen to.
- ✓ Incorporate speakers evenly throughout the facility to minimize any delay or muffling of sound.

Floor

- ✓ Carpets, floor mats, drapes, flooring material, and fabric furniture can be used to help absorb noise.
- ✓ In high traffic areas such as the nurses' station, elevator, or kitchen, different flooring materials should be used to help absorb unwanted noise. Carpet is a better choice than hardwood flooring.
- ✓ When choosing carpet, make sure the maximum thread thickness is less than a quarter-inch thick.

Walls

- ✓ Different wall construction types should be used to reduce the transfer of noise from one room to another. These include double walls, staggered double walls, and double stud walls.
- ✓ Batt insulation, rigid insulation, or spray foam insulation also reduce the transfer of noise from one room to another.

- ✓ Sound Transfer Class is a rating of a material's ability to reduce the transfer of airborne noise. The STC chart is a useful resource when choosing materials for the floors, walls, and ceilings.

Ceiling

- ✓ When choosing ceiling materials, the architect or designer must take into consideration the high noise reduction co-efficient (NRC), or the amount of sound that is reflected back from the surface of a material.
- ✓ Incorporate recessed ceilings in alcoves to provide a sense of security.
- ✓ Avoid using Acoustic Ceiling Tiles (ACT).
- ✓ Use Gypsum wallboard in the ceiling with a knockdown or spray texture.
- ✓ Choose ceiling colors that contrast with the walls.
- ✓ If using ceiling patterns, do not use bold patterns.

Lighting

- ✓ By setting a light fixture to exert an electrical output of 2000 lux, the body will reset its circadian rhythm causing a sleeping person to wake up.
- ✓ The use of bright light, however, can make a care facility feel too sterile and institutional; therefore, a dimmer should be installed to adjust to the brightness of light depending on the resident.
- ✓ For everyday activities and business, 500 lux or less is suitable.
- ✓ Ensure that adequate lighting is provided in threshold areas such as openings in walls and doorways.
- ✓ Eliminate glare from natural sunlight and light fixtures. Glare can cause daily discomfort and can be dangerous to those with advanced-stage dementia; glare can visually confuse a resident causing him or her to trip or fall.
- ✓ Provide easy-to-handle task lights for residents engaged in activities that might require more area lighting.
- ✓ Use matte finishes on materials to reduce glare.

- ✓ Choose rocker rather than toggle style light switches. These are easier for those with arthritis to use.

Smells or Odors

- ✓ Follow the recommendations of the ANSI/ASHRAE Standard 62.1-2013 Ventilation for Acceptable Indoor Air Quality
- ✓ Incorporate odor sensors within the facility that are connected, wirelessly or wired, to the nurses' station.
- ✓ Provide adequate ventilation throughout the facility to help remove unwanted odors.

Reducing Glare

- ✓ Use vinyl shutters, blinds, or curtains on the insides of windows and glass doors to help reduce glare from outdoor light.
- ✓ To reduce glare in transitional areas, provide coverings over porches and the entry into the foyer or lobby.
- ✓ Include taller windows, windows closer to the ceiling, and other indirect sources of lighting to create an even spread of light throughout the room.
- ✓ In common areas such as the living room, lobby, and dining areas, skylights in the ceiling can be added.
- ✓ Avoid reflective tiles or finishes on walls and floors, which can visually distract and agitate residents.
- ✓ Shading devices on the exterior facades of the building can help reduce the amount of light entering the building.
- ✓ For the northern and southern sides of the building, use vertical louvers or shading devices; for western and eastern sides, use horizontal louvers or shading devices.

Color

- ✓ Color contrast is a central aspect in the design of a Dementia Care Facility. Bold contrast can help improve residents' depth perception and visual comprehension.
- ✓ Doors, furniture, tabletops, and countertops should have colors and textures that contrast with the walls and floors.
- ✓ Dishes should contrast with tabletops.
- ✓ Use existing color research to identify the colors that are more generally applicable to the specific human experiences and emotions being encouraged in a space.
- ✓ Because older adults have a hard time distinguishing colors, matching the exit door with the walls can help camouflage the door, preventing wandering residents from finding it unnecessarily.
- ✓ For best results, three to five colors should be selected for the entire facility.
- ✓ Make sure there is sufficient contrast between the wall and floor colors in each room and that each room's colors are chosen based on the room's role in facility life.
- ✓ Choose furniture colors that clearly separate the pieces from both the walls and the floors.

Patterns

- ✓ Use contrasting patterns to help residents differentiate between objects and spaces.
- ✓ Avoid bold patterns, which can agitate or confuse residents.
- ✓ For dining areas, large patterns on chairs are acceptable. For multi-purpose areas, smaller patterns are recommended.
- ✓ Different patterns should be used for different rooms.
- ✓ Fabric patterns should match the scale of the room.

Thermal comfort

- ✓ Air conditioning should be used sparingly. It should only be used on days when there are no trade winds or when vog (volcanic smog) is present.
- ✓ Design the facility with adequate adjustable openings to allow maximum cross ventilation through the building.
- ✓ The average temperature in the facility should remain between 72 and 78 degrees Fahrenheit.

Linking the Interior Space with the Exterior Space

- ✓ Incorporate natural ventilation in the facility design to bring in fresh, clean air and ejects used or recycled air.
- ✓ One way to incorporate outdoor and indoor spaces is through the use of sliding accordion doors.
- ✓ Another way to encourage natural airflow is through the installation of large openings along the sides of the building perpendicular to the prevailing winds.
- ✓ Porches and lanais are a link between indoor and outdoor spaces that can be used as places for residents and their families and visitors to gather and sing, talk, and eat together.

Interior Guidelines

Wayfinding

- ✓ Keep wayfinding elements as simple and obvious as possible to minimize daily stress and anxiety for residents.
- ✓ Use wayfinding elements not only to provide directions for moving around a facility but also to prevent access to restricted or hazardous areas.
- ✓ Do not place repetitive elements such as lighting fixtures or carpet patterns in long corridors.
- ✓ Incorporate both single and double loaded corridors to break up repetitive corridors.
- ✓ Incorporate different colors or other recognizable local elements to help residents find their way.
- ✓ Design the ends of hallways as cul-de-sacs to contain wandering.
- ✓ See the following section, *Visual Cues*, for more wayfinding suggestions.

Visual Cues

- ✓ Place a nameplate, shadowbox, or pinup board on each resident's bedroom door.
- ✓ Provide wall space for residents' pictures or artwork created while at the facility. Artwork in the hallways can help residents orient themselves.
- ✓ Colors and textures can be used to help guide residents throughout a facility.
- ✓ Keep visual cues simple to understand and follow.
- ✓ Contrast visual cues with the environment.
- ✓ Along with text, pictures, and color, include visual cues in Braille.
- ✓ The facility should also consider printing additional placards in the languages of the surrounding community and of its residents and their families. In Hawai'i, these might include Hawaiian, Polynesian languages, Filipino, Japanese, Chinese, or Korean.

Signage

- ✓ Lettering: Raised letters and numbers accompanied with Grade 2 Braille.
- ✓ Contrast: The color(s) of the text must contrast the color(s) of the background.
- ✓ Height: There should be sixty inches from the finished floor to the centerline of the sign.
- ✓ Location: Signs must be placed adjacent to the latch side of the door and two to three inches away from jamb.
- ✓ Width-to-Height Ratio: The letters on the sign must either be a 1:1 ratio or a 3:5 ratio.

Spatial Layout

- ✓ The overall floor plan should resemble a racetrack in form.
- ✓ Situate the kitchen, the focal point of the facility, in the center of the racetrack.
- ✓ Position the bedrooms along the perimeter of the facility, on the outside of the track. This connects them to natural ventilation and light.
- ✓ The building core and utilities should be integrated within the facility in a way that feels natural. For example, the Plazas built their lobby around the elevator core, a block secured from the rest of the facility, thereby preventing residents from wandering out of the front door and off property.
- ✓ Minimize the amount of corners and hidden spaces throughout the facility.
- ✓ Situate the nurses' station in a centralized area to reduce the travel time for nurses responding to residents in need.
- ✓ Incorporate nooks in areas that offer pleasant views, such as a view of the wandering garden or the city in the distance.

Interior Furniture

- ✓ Provide a variety of sizes and styles of furniture in public spaces.
- ✓ Chairs should have armrests that do not extend past the edge of the seat.
- ✓ Furniture should be firm—not too soft or deep.

- ✓ Seat heights should range between 17 and 19 ½ inches.
- ✓ Ensure furniture edges are blunt or rounded. Avoid furniture with sharp edges.
- ✓ Furniture colors should contrast with floor and wall colors.
- ✓ Select furniture that provides proper back support and keeps the user upright.
- ✓ Choose fabrics that provide extra protection from stains and tears and are easy to clean, without sacrificing the design or pattern.
- ✓ Use proper rubber or felt feet to prevent slippage. Chairs should not be able to slip away from the residents.
- ✓ Tables in the dining area should accommodate no more than four and tables in the activity room, no more than two, to minimize agitation or anxiety.

Indoor Safety and Security

- ✓ To keep track of the whereabouts of the residents in a less conspicuous manner, implement different types of available security systems, including ultrasonic motion detectors, pressure mats, passive infrared photoelectric sensors, and switch sensors.
- ✓ All security systems should be hardwired to both the building and to the backup generator system.
- ✓ Minimize the use of closed-circuit televisions (CCTVs) in residents' rooms, as they often feel too institutional.
- ✓ All restricted areas should be locked with a keypad or a physical key lock.
- ✓ Flooring materials should be slip resistant. The finish should also be a matte finish to minimize glare.

Elopement

- ✓ Because residents who wander also have a hard time deciphering colors, disguising the exits is a generally effective way to keep them from being discovered.

- ✓ The Hale Ku'ike, another local Dementia Care Facility, uses a locking system where a silent alarm will trigger 15 seconds after the door is opened. The user has that amount of time to punch in the correct disarming code.
- ✓ Provide a safe environment in which residents can wander, an important feature of any facility. Wandering along secure hallways can help residents cope with anxiety and agitation.

Windows

- ✓ Use double- or triple-pane windows, which perform better than single-pane windows.
- ✓ Install some sort of operable curtain or blinds on each window to help reduce the noise vibrations and glare.
- ✓ Limit the ability of windows to open to a maximum of 6 inches. Natural air can still enter the building, but this prevents a resident from falling or getting stuck in the window if attempting to end his or her life.

Daylighting

- ✓ Use software programs such as DIVA for Rhino, Ecotect, and Lighting Analysis for Revit, Revit, and Revit Architecture to simulate light entering a building before it is built.
- ✓ Use the LEED EQc8.1, a checklist created by the United States Green Building Council (USGBC) that helps architects create designs that provide a good connection between indoor and outdoor spaces.
- ✓ Daylighting can create direct glare, so shield or diffuse the light to create an even exposure in the room.
- ✓ Incorporate skylights or light tubes in hallways or large public gathering spaces to help bring natural light to places farther away from the windows.
- ✓ Light shelves are another element that can be added to help diffuse sunlight deeper into a room.
- ✓ All bedrooms should be able to let in natural light

- ✓ Design high ceilings and tall windows in larger public spaces to allow more light to enter the room. The ratio of light entering a building is 1:2. For example, if the room height is 8 feet, the farthest the light can reach into the room is roughly 16 feet.

Interior Doors

- ✓ Doors within a facility should be one-hour fire-rated residential doors.
- ✓ Doors should be at least 36 inches wide for handicap accessibility.
- ✓ Bedroom doors should have a wood finish rather than a solid painted finish.
- ✓ BOH doors can be standard metal-skinned fire-rated doors.
- ✓ Install padlock, key, or security card locks on facility doors.
- ✓ Exterior doors should either be automatic or have a handicap door activation switch.
- ✓ Shower room and restroom doors should be 42 inches wide for easier access.
- ✓ Match doors to the rooms.
- ✓ Glass accordion doors can provide a semi-private area for agitated residents while still allowing residents to visually participate in activities.
- ✓ Doors should have a push resistance of no more than 5 pounds.
- ✓ Place automatic doors at the entrance of the facility.
- ✓ All door handles should be levers rather than knobs, making doors easier to open for those with arthritis.

Vocabulary

Types of Facilities

Adult Day Care (ADC): An adult day service that offers part- or full-time care in a group setting. Adult day care is an appropriate choice for those who are unable to stay at home alone, even for short periods. Adult day care offers supervised care within a safe and secure environment. It may be community- or facility-based. Services typically include meals, social or recreational activities, and health-related assistance.²²⁹

Adult Residential Care Home (ARCH): A home for older adults that has at least seven beds. The home must provide twenty-four-hour personal care services (bathing, dressing, grooming, etc.) and supervision. However, this type of home is not required to have nurses on duty within the home.²³⁰

Assisted Living Facility (ALF): A long-term care option that combines housing, support services and health care, as needed. Assisted living is designed for individuals who require assistance with everyday activities such as meals, medication management or assistance, bathing, dressing and transportation. Some residents may have memory disorders including Alzheimer's, or they may need help with mobility, incontinence, or other challenges. Residents are assessed upon move-in and any time there is a change in condition. The assessment is used to develop an Individualized Service Plan.

Care Home: Also known as adult family homes, board and care homes, and residential care or personal care homes, a home that offers personalized

²²⁹ 2008. Types of Care. October 3. Accessed 1 2015, February.
<http://careconversations.org/types-care>.

²³⁰ J, Triangle. 2010. Opening a Family Care Home. Accessed January 30, 2015.
<http://www.tjaaa.org/opening-a-family-care-home.aspx>.

service to small groups of adults. These residential homes provide lodging, meal services, and assistance with daily living activities.²³¹

Cohousing: A type of intentional, collaborative housing in which residents actively participate in the design and operation of the neighborhood. Cohousing provides the privacy a resident is accustomed to within a community setting. Cohousing residents consciously commit to living as a community.

Continuing Care Retirement Communities (CCRC): Part independent living, part assisted living, and part skilled nursing home, these retirement communities offer a tiered approach to the aging process, accommodating residents' changing needs. Upon entering, healthy adults can reside independently in single-family homes, apartments or condominiums. CCRCs can accommodate independent living, assisted living, and nursing home care, offering residents a continuum of care. A person can spend the rest of his or her life in a CCRC, moving between levels of care as needed. People in the senior housing industry call this "aging in place," although it does require leaving one's original residence.

Hospice: A home providing care for the sick, especially the terminally ill.

Intermediate Care Facilities (ICF): A health facility that provides medically-related services to persons with a variety of physical or emotional conditions requiring institutional facilities but without the degree of care provided by a hospital or skilled nursing facility. An example is an intermediate care facility for mentally retarded or other developmentally disabled persons.

Memory Care Unit: A distinct form of long-term skilled nursing that specifically caters to residents with Alzheimer's disease, dementia, and other types of memory problems.

Nursing home: A private institution providing residential accommodations with health care, especially for elderly people.

²³¹ 2013. What are Residential Care Homes. February.
<http://www.aplaceformom.com/care-homes>.

Residential Care: See **Care Home**.

Respite Care: The provision of short-term accommodation in a facility outside the home that provides temporary relief to those caring for family members who might otherwise require permanent placement in a facility outside the home.

Skilled Nursing Facility (SNF): Medicare only covers limited stays in nursing homes. Skilled nursing or rehabilitation services are covered for a period of about 100 days after a hospitalization. Medicare does not cover custodial care (such as assistance with feeding, bathing, and dressing), if it is the only care needed. SNFs provide therapy to elderly residents who can afford the care.

Special Care Units: Units that “exist to better meet dementia residents' needs and to protect residents without dementia in nursing homes and residential care facilities.”²³² Alzheimer advocates are concerned about the quality of long-term care in Special Care Units in places where no standards have been established.

Types of Insurance

Medicaid: The largest source of funding for medical and health-related services for people with low income in the United States.²³³

Medicare: “The federal health insurance program for people who are 65 or older, certain younger people with disabilities, and people with End-Stage Renal Disease (ESRD).”²³⁴ Different parts cover different services:

Part A (hospital insurance)

Part B (medical insurance)

²³² Alzheimer's Association. 2014. Special Care Units. Accessed March 19, 2015. http://www.alz.org/join_the_cause_special_care_units.asp.

²³³ Medicaid.gov. n.d. Eligibility. Accessed January 30, 2015. <http://www.medicare.gov/Medicaid-CHIP-Program-Information/By-Topics/Eligibility/Eligibility.html>.

²³⁴ Medicare.gov. n.d. What is Medicare? Accessed January 29, 2015. <http://www.medicare.gov/sign-up-change-plans/decide-how-to-get-medicare/whats-medicare/what-is-medicare.html>.

Part C (Medicare Advantage Plans)

Part D (prescription drug coverage)

General Vocabulary

ADAAG: Americans With Disabilities Act Accessibility Guidelines

ADL: Activities of daily living; there are six basic ADLs including eating, bathing, dressing, walking, using the restroom, and continence.

Alzheimer's Disease: A type of dementia that causes problems with memory, thinking and behavior. Symptoms usually develop slowly, worsening over time, and becoming severe enough to interfere with daily tasks. Alzheimer's is the most common form of dementia. Alzheimer's accounts for roughly 60 to 80% of dementia cases. Alzheimer's normally affects elderly people from 65 and older. Early onset Alzheimer's is another less common form.

ASHRAE: American Society of Heating, Refrigeration, and Air Conditioning Engineers; an organization that works to improve the indoor environment quality within the Heating, Ventilation, and Air Conditioning (HVAC) industry.

Cognitive Function: "An intellectual process by which one becomes aware of, perceives, or comprehends ideas. It involves all aspects of perception, thinking, reasoning, and remembering."²³⁵

Cognitive Impairment: When a person has trouble remembering, learning new things, concentrating, or making decisions that affect their everyday life. Cognitive impairment ranges from mild to severe.

Computerized Axial Tomography (CAT) Scan: Also CT Scan; "special X-ray tests that produces cross-sectional images of the body using X-rays and a computer."²³⁶

²³⁵ Dictionary, Mosby's Medical. n.d. Mosby's Medical Dictionary, 8th edition. S.v. "Cognitive Function.". Accessed March 7, 2015. <http://medical-dictionary.thefreedictionary.com/Cognitive+Function>.

²³⁶ emedicine health. 2014. CT Scan. December 12. Accessed March 2, 2015. http://www.emedicinehealth.com/ct_scan/article_em.htm.

DCAB: Disability and Communication Access Board; a group 17 individuals that review and provide recommendations on all State and County plans and specifications for buildings, facilities, and sites, as required under Hawaii Law HRS 103-50, in order to ensure that they are designed and constructed to be accessible to persons with disabilities.

Delayed Egress: An electromagnetic lock that, once a door is opened, waits for 15 to 30 seconds before setting off an alarm unless the user punches in a code to deactivate it. These are typically used on facility exits.

Delusions: Typically a mental disorder where someone firmly believes something is true despite being contradicted.

Dementia: “A general term for loss of memory and other mental abilities severe enough to interfere with daily life. It is caused by physical changes in the brain.”²³⁷ Types of dementia include Alzheimer’s disease, Vascular dementia, Dementia with Lewy bodies (DLB), Mixed dementia, Parkinson’s disease, Frontotemporal dementia, Creutzfeldt-Jakob disease, Normal pressure hydrocephalus, Huntington’s disease, and Wernicke-Korsakoff Syndrome.

Disability: A physical or mental condition that makes you unable to function in some way.

Double Loaded Corridor: A building design that has individual units on both sides of a corridor.

Early onset Alzheimer’s: Or younger-onset; “Alzheimer’s that affects people younger than 65.”²³⁸ A person may develop symptoms as early as their 40s or 50s. According to the Alzheimer’s Association, around 200,000 Americans currently have early onset Alzheimer’s.

²³⁷ Alzheimer’s Association. n.d. *Types of Dementia*. Accessed February 20, 2015. <http://www.alz.org/dementia/types-of-dementia.asp>.

²³⁸ Alzheimer’s Association. n.d. *Younger/Early onset Alzheimer’s and Dementia*. Accessed February 20, 2015. http://www.alz.org/alzheimers_disease_early_onset.asp.

End-of-life care: A “term used to describe the support and medical care given during the time surrounding death.”²³⁹ This can last days, weeks, and even months, depending on the circumstances.

Hallucination: An experience involving the apparent perception of something not present.

Handicap: A mental or physical disadvantage, such as blindness or a missing leg, or something that disables a person in some way. Handicaps can also be imposed artificially to even out the odds in sporting events.

Hard Cost: In construction, an industrial term that covers the complete construction cost, which is normally estimated by a skilled estimator.

HVAC: Heating, Ventilation, and Air Conditioning; the technology of indoor environmental comfort.

IADL: Instrumental Activities of Daily Living; activities involved in independent living and are valuable in measuring dementia progress in an older adult.

IBC: International Building Code; a building model code developed by the International Code Council (ICC). It has been adopted throughout most of the United States.

IFC: International Fire Code; a model code that regulates minimum fire safety requirements for new and existing buildings, facilities, storage, and processes.

Magnetic Resonance Imaging (MRI): A “technique that uses a magnetic field and radio waves to create detailed images of the organs and tissues within your body.”²⁴⁰

Modular Design: A design system that breaks larger parts into smaller parts that can be used either independently or in unison.

NFPA 101: The Life Safety Code; a “source for strategies to protect people based on building construction, protection, and occupancy features that

²³⁹ National Institute on Aging. 2015. End of Life: Helping with Comfort and Care. January 22. Accessed March 5, 2015. <http://www.nia.nih.gov/health/publication/end-life-helping-comfort-and-care/introduction>.

²⁴⁰ Mayo Clinic Staff. 2013. Test and Procedures MRI. August 17. Accessed March 2, 2015. <http://www.mayoclinic.org/tests-procedures/mri/basics/definition/prc-20012903>.

minimize the effects of fire and related hazards. Unique in the field, it is the only document that covers life safety in both new and existing structures.”²⁴¹

Paranoia: “Paranoia involves intense anxious or fearful feelings and thoughts often related to persecution, threat, or conspiracy. Paranoia occurs in many mental disorders, but is most often present in psychotic disorders.”²⁴²

Porte-cochère: A structure above from the entrance of a building that reaches over the driveway to provide shelter for those entering or exiting a vehicle.

Positron Emission Tomography (PET) Scan: An imaging test that uses a radioactive substance called a tracer to look for disease in the body.

Progressive disease: “A disease or health condition that gets worse over time, resulting in a general decline in health or function. Unlike a relapsing and remitting disorder, there are not many periods of relief from a progressive disorder. Depending on the diagnosis, your progressive disorder may move quickly or slowly.”²⁴³

Soft Cost: In construction, soft cost is an industrial term that covers the finances of design. This includes architectural, engineering, and surveying costs.

Universal Design: The design of products or environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design.

Wayfinding: Spatial orientation, problem solving, and navigation. It is using information from one’s surroundings to navigate to a possibly imprecisely known destination. In architectural design, it is the organization of spatial cues and environmental information to help users find their way.

²⁴¹ National Fire Protection Association. 2015. *NFPA 101: Life Safety Code*. Accessed October 30, 2015. <http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=101>.

²⁴² Mental Health America. 2016. What is Paranoia? Accessed March 20, 2016. <http://www.mentalhealthamerica.net/conditions/paranoia-and-delusional-disorders>.

²⁴³ Jacques, Erica. 2009. What Is a Progressive Disorder? May 11. Accessed March 1, 2015. http://pain.about.com/od/whatischronicpain/g/progressive_disorder.htm.

Appendix A

Additional Resources

Chapter 1

If you have any specific questions regarding Alzheimer's behavioral issues, contact your local Alzheimer's chapter.

Alzheimer's Association, 24/7 Helpline

Tel: (800) 272-3900

TDD: (866) 403-3073

E-mail: info@alz.org

Alzheimer's Association, Hawai'i Chapter

Tel: (808) 591-2771

Address: 1130 N Nimitz Hwy, A-259, Honolulu, HI 96817

E-mail: info@alz.org

Behavior Brochure, Alzheimer's Association.

Distributed by your local Alzheimer's Association Chapter. Proceeds go to the Alzheimer's Association.

Anne Robinson, Beth Spencer, Laurie White. *Understanding Difficult Behaviors*

Distributed by your local Alzheimer's Association Chapter. Proceeds go to the Alzheimer's Association.

Chapter 3

Victor Regnier. *Design for Assisted Living: Guidelines for Housing the Physically and Mentally Frail*.

Visitability: <http://concretechange.org/>

Chapter 6

Alzheimer's Association, 24/7 Helpline

Telephone: (800) 272-3900

TDD: (866) 403-3073

E-mail: info@alz.org

Alzheimer's Foundation of America

322 Eighth Ave., 7th fl., New York, N.Y. 10001

Telephone: (646) 638-1542

Toll-Free Helpline: (866) 232-8484

E-mail: <http://www.alzfdn.org/AboutUs/email.html>

Namaste Care

Joyce Simard, M.S.W.

Land O' Lakes, Florida

Telephone: (781) 588-0876

E-mail: joycesimard@earthlink.net

Appendix B

Certified Aging-In-Place Specialist

Objective

A Certified Aging-in-Place Specialist (CAPS) designation program is an educational course that the Building Industry Association (BIA) offers to realtors, architects, contractors, and interior designers that focuses on all aspects of renovating structures for the aging-in-place population. The course educates and trains professionals in the best methods for helping to improve the quality of life for both older adults and their families. CAPS currently targets the baby boom generation. People who take the two-part sixteen-hour course learn about both the marketing and the design aspects. Upon completion, a person should be able to answer general questions about retrofitting a home so that a household member may age comfortably and safely in place.

This course differs from other BIA courses because each class ends with a test on the material covered. A certificate and plaque are sent to the participant four to six weeks after completing the course and passing two major exams.

Information Regarding CAPS

CAPS was created by the NAHB University of Housing and the NAHB Remodelers Council in cooperation with the US Administration on Aging (AIA), the American Association of Retired Persons (AARP), and the NAHB Older adult Housing Council of 2002.²⁴⁴ CAPS not only trains its course participants in how to design for the care of older adults, it also equips them with business, marketing, and customer service skills, tools they will need to navigate the aging-in-place market.²⁴⁵

²⁴⁴ National Association of Home Builders. 2007. Marketing and Communication Strategies for Aging and Accessibility (CAPS 1). Washington D.C.: National Association of Home Builders. i-4.

²⁴⁵ Ibid., i-9

The first half of the course teaches the participant relevant marketing and communication skills. Unless the participant is a realtor with extensive background in marketing and communications, many participants do not have any prior knowledge of or experience in marketing and communications.

The course is broken down into eleven sections. The first four sections focus on identifying, analyzing, accessing, and selling oneself in the aging-in-place market. Through these four sections, participants learn how to shape their companies' images. This part of the course explains the challenge many families face when deciding who they should hire as their designer or contractor and the sensitivity designers or contractors need.

The second half of the course focuses on the design aspect. The seven sections included in this half are market, contractual considerations, categories of design and building standards, assessment, estimate and schedule, executing the job, and design solutions. This portion of the course is more for the contractor, designer, and architect. This section goes over sensitive information a designer must have when working with a client. Below are some recommendations designers should consider when retrofitting existing homes:

- Use a licensed therapist that has insurance in case an accident should occur.
- Use your best judgment to minimize cost and material,
- If you are questioning a product the owner wants to use, get a consent form in writing waiving any liability to yourself.
- Never present yourself as an expert on matters other than remodeling.²⁴⁶
- Always have insurance to protect yourself and your company.
- Include a clause in your contract in case your client dies or becomes incapacitated.²⁴⁷

²⁴⁶ Ibid., 2-18.

²⁴⁷ Ibid., 2-19

This portion of the course also expands on different standards and terms widely used in the construction industry. Terms such as universal, adaptable, accessible, and visitable are used when conducting and aging-in-place redesign. The course also discusses different federal guidelines such as those from the American National Standards Institute (ANSI), the Americans with Disability Act Accessibility Guidelines (ADAAG), the Uniform Federal Accessibility Standards (UFAS), and the Federal Housing Accessibility Guidelines (FHAG).

A professional who is CAPS trained can renovate existing structures as well as provide input on new development. CAPS designers often work closely with occupational therapists or a Health Care Provider (HCP).

Personal Experiences

Prior to taking this class, the author had heard stories from others who had taken the course about the great challenges they had had to endure. He assumed the class would be completely hands-on, but the course did not turn out as expected. The course was broken down over two eight-hour days. The first day, the author was assigned the position of caregiver, and the second day, of disabled person.

Throughout the first day as a caregiver, the author could use the restroom and move about the room without any difficulty. The only challenge took place during lunch when he was told to put a tennis ball into a tube sock and wear it on his dominant hand. This simulated the experience of a person suffering from arthritis. It was too difficult to manage chopsticks, so he tried a fork. The fork made eating marginally easier, but eventually, he moved to his less dominant hand.

During the second day, the author stayed in a wheelchair for the eight-hour duration. This portion of the course was definitely an eye-opener. The first thing he noticed was the physical discomfort of sitting for eight hours straight. At first, the author reported it was difficult to move around in the wheelchair, but by the end of the day, he was able to maneuver without any problems.

It was difficult to drink liquids and pick food up from the table. It was also difficult to open doors and use the restroom. The author constantly rolled backwards when trying to open doors. By watching others in the class struggle, however, he discovered a way to keep himself from rolling backwards. Transferring from wheelchair to toilet took a while to figure out.

Another difficulty of using a wheelchair was going up and down handicap ramps. People who are not handicapped may take for granted how easy it is to change elevation on a slant, but for people in wheelchairs, going up and down ramps can be very hard. The author had trouble going both up and down. Going down the ramp was difficult because he picked up speed and slowing down was a challenge. Going up the ramp required great strength and coordination of movement. It became evident that if a handicapped person is not in great physical condition, it is likely that he or she will struggle going up ramps. It is literally a matter of pushing one's own weight up a slight incline while fighting gravity.

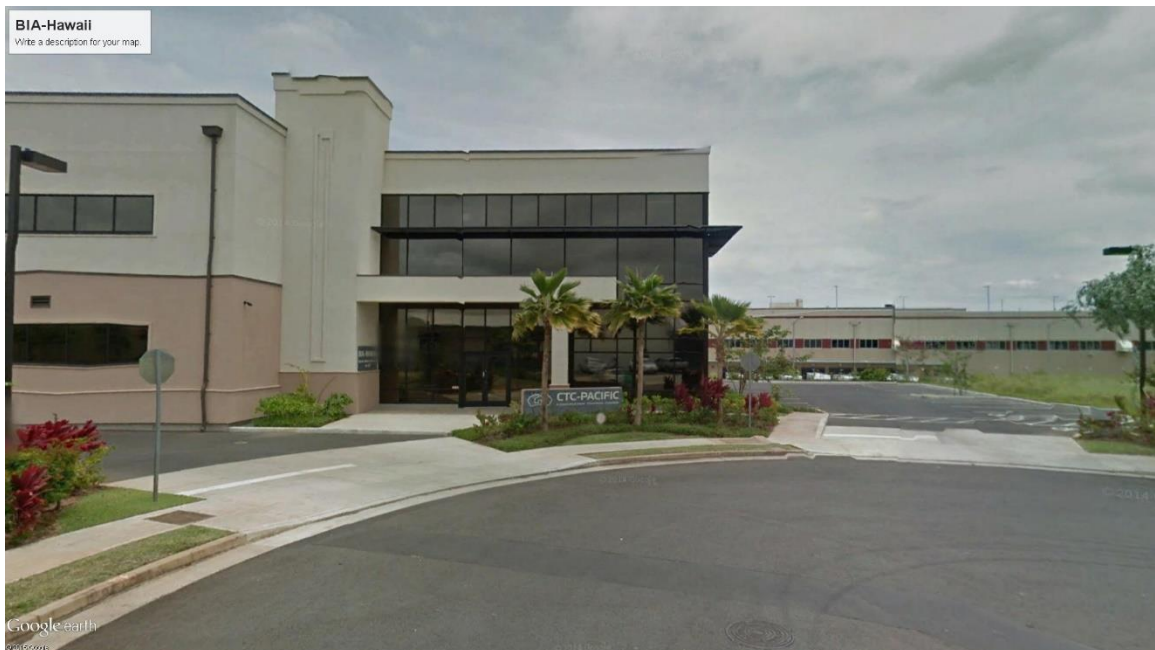


Figure 102: Entrance to the BIA-Hawai'i training facility. The handicap ramp is behind the sign and foliage. Photo taken from Google Earth.

Lessons Learned

While studying at the university, the author was repeatedly told to design buildings using ADA guidelines. These minimum guidelines were created to ensure that people with disabilities could live and move about with minimal discomfort. However, after having to roll through a thirty-six-inch-wide door that was spacious enough to move through but had a 5/8" threshold that was surprising difficult to cross, he understood the guidelines a little better. The challenge created by such a small threshold was astonishing as well as the difficulties a wheelchair user may experience daily in a standard-sized restroom.

The CAPS course also delineated the different aspects involved in obtaining a certification. A CAPS professional receives extensive training in marketing. By being able to identify the needs involved in the AIP market, the professional will then have the ability to analyze, access, and sell his or her services and products. These skills can help a person successfully navigate a career in the construction industry.

Even though the CAPS training focuses on AIP, the author chose to audit this course in order to expand his understanding of the difficulties that people with Alzheimer's may experience every day as well as elements in the built environment that can affect them. Many older adults who suffer from Alzheimer's also suffer from other illnesses, such as arthritis. Also, many older adults, at some point, due to an injury or other condition, may need to use wheelchairs to be mobile. This course provided the author with a deeper understanding of and further insight into some of the design requirements involved in designing for those who suffer from arthritis and other physical disabilities.



Figure 103: The sock with tennis ball over my hand represents a handicapped person with arthritis. Photo taken by Norma Hara.

Appendix C

State Regulations for Dementia Care

Objective

This section examines how each state regulates home care for older adults with dementia. The following information was gathered from numerous sources and compiled by the American Health Care Association (AHCA) together with the National Center for Assisted Living (NCAL) in 2013.

According to the its website, the AHCA “is a non-profit federation of affiliate state health organizations, together representing more than 11,000 non-profit and for-profit nursing facility, assisted living, developmentally-disabled, and subacute care providers that care for approximately one million elderly and disabled individuals each day.”²⁴⁸ The NCAL, “the assisted living voice of the AHCA,” is dedicated to educating local assisted living providers in the care of older adults to ensure that a basic standard of care is met.

In their *Assisted Living State Regulatory Review 2013*, the AHCA/NCAL provides a summary of assisted living specifications for each state. All the information is important, but for the purposes of this dissertation, only the following six considerations, as defined in the review, are recorded here for each state :

1. Physical Plant Requirements summarizes the square footage requirements for resident units and any other special physical plant requirements.
2. Residents Allowed per Room summarizes the maximum number of residents allowed per resident unit.

²⁴⁸ AHCA/NCAL. “About AHCA.” Accessed March 13, 2016.
https://www.ahcancal.org/about_ahca/Pages/default.aspx

3. Bathroom Requirements indicates whether bathrooms may be shared and how many toilets, lavatories, and/or bathing facilities are required per resident.
4. Life Safety summarizes fire safety requirements and other standards ensuring residents' physical safety.
5. Alzheimer's Unit Requirements indicates whether facilities are permitted to care for residents with Alzheimer's disease and/or summarizes special requirements for facilities that care for such residents.
6. Staff Training for Alzheimer's Care indicates any additional training that may be required for staff providing care for individuals with Alzheimer's disease or other forms of dementia.

Note that the numbering was introduced here to clarify the information presented in table 28. Also, aside from the fifth and sixth requirement fields, these regulations concern assisted living facilities in general, not Dementia Care Facilities. Finally, not all details from the original review are included here; only those that help provide a general picture of each state's quality of regulations for dementia care facilities.

Table 24: Specifications for building for dementia care by state according to the AHCA/NCAL Assisted Living State Regulatory Review 2013 where: 1) Physical Plant Requirements, 2) Residents Allowed per Room, 3) Bathroom Requirements, 4) Life Safety, 5) Alzheimer'

State	Specifications
Alabama ²⁴⁹	<ol style="list-style-type: none"> 1. Private resident units must be at least 80 square feet and semi-private resident units must be at lease 130 square feet. 2. No more than two residents per room. 3. At least one bathtub for every eight residents, one lavatory for every six residents, and one toilet for every six residents. 4. Dementia care facilities are divided into three categories: Family (2 to 3 residents), Group (4 to 16 residents), and Congregate (17 or more residents). Group and Congregate facilities must abide by the National Fire Protection Agency evacuation plan. 5. Non-licensed facilities are not allowed to care for or admit any older adults with cognitive impairments. They are also not allowed to advertise themselves as a "Dementia Care Facility." 6. Before contact with residents, all staff must take courses on special related topics. They must also take at least six hours of continuing education (CE) annually.
Alaska ²⁵⁰	<ol style="list-style-type: none"> 1. Facilities must provide each resident with furniture typical of a home in the community. The facility must be the sole occupant of the building it is in, unless "the other occupancy is consistent with the safety, comfort, and well-being of the residents." All building occupants must obey fire and environmental health codes. 2. No more than two residents per room. 3. At least one sink, toilet, and shower/bath for every six resident. 4. The minimum fire code states that regular fire drills must be

²⁴⁹ Polzer, Karl. 2013. "Assisted Living State Regulatory Review 2013." National Center for Assisted Living. March. Accessed July 19, 2015.
http://www.ahcancal.org/ncal/resources/Documents/2013_reg_review.pdf, 2-4.

²⁵⁰ Ibid., 5-6.

State	Specifications
	<p>conducted periodically. Windowsills, size, and operability must follow code.</p> <p>5. Alaska does not have any requirements for older adults with Alzheimer's except for an alarm system to alert staff members when residents wander.</p> <p>6. No specific regulation.</p>
Arizona ²⁵¹	<p>1. Building codes must comply with all current local building codes and ordinances. Each resident is entitled to a minimum of 60 square feet.</p> <p>2. No more than two residents per room.</p> <p>3. At least one full bathroom for every eight residence.</p> <p>4. Facilities must abide by the NFPA (National Fire Protection Association) requirements and have sprinklers installed or an alternative method ensuring residents' safety.</p> <p>5. "Facilities must follow directed cares rules."</p> <p>6. "An overview of Alzheimer's disease and other dementia is required for directed care."</p>
Arkansas ²⁵²	<p>1. Level I facility units must be independent apartments with a distinct kitchen. Each unit must provide at least 150 square feet for one and at least 230 square feet for every two residents. Level II facilities must have a separate area for higher levels of care.</p> <p>2. Level I units are single occupancy except where residents are married or are two consenting adults who have agreed in writing to live together.</p> <p>3. Each unit must have a full bathroom.</p> <p>4. All assisted living facilities built after April 2001 must abide by NFPA 101, Life Safety Code 1985, or the 2000 IBC (International</p>

²⁵¹ Ibid., 8-9.

²⁵² Ibid., 12-13.

State	Specifications
	<p>Building Code) rules and must comply with the Americans with Disabilities Act.</p> <ol style="list-style-type: none"> 5. "Level I and II facilities may have an Alzheimer's special care unit" as long as additional requirements are met (egress control, staff training, therapeutic activities, physical design, etc.) 6. All staff members must be trained within five months of hiring, with no less than eight hours per month during those five months" in specific subjects. Staff must obtain at least two hours of ongoing training every quarter.
California ²⁵³	<ol style="list-style-type: none"> 1. Private and semi-private units must be furnished by the provider or resident and have allowable space for mobility and equipment. 2. No more than two residents per unit. 3. Private and shared toilets are allowed. At least one toilet and sink for every six residents and one bathtub or shower for every ten residents. 4. All RCFEs (Residential Care Facilities for the Elderly) must follow State Fire Marshal protocols as well as the NFPA regulations. Each facility must also have a prominently posted emergency disaster plan available to emergency responders. 5. RCFEs may admit residents with dementia "if certain requirements are met." Egress alert devices, delayed egress, and locked facility doors are permitted if adequate supervision and enhanced physical plant safety requirements are met. 6. All staff members must undergo dementia care training. Training requirements for providing additional specialized care include six hours of dementia care orientation during the first four weeks of employment and at least eight hours of annual training.
Colorado ²⁵⁴	<ol style="list-style-type: none"> 1. Private units must be at least 100 square feet. Semi-private units

²⁵³ Ibid., 18-19.

State	Specifications
	<p>must provide at least 60 square feet per resident.</p> <ol style="list-style-type: none"> 2. No more than two residents per unit. 3. At least one full bathroom for every six residents. Bathrooms include a toilet, sink, tub or shower, and towel rack. 4. All assisted living facilities must abide by the NFPA life safety code (2003). Automatic fire sprinklers and smoke detectors are required. 5. Secured units are required for residents with Alzheimer's disease. 6. Staff training is required to work with residents with Alzheimer's. There should be no more than six residents per staff member.
Connecticut ²⁵⁵	<ol style="list-style-type: none"> 1. Facilities must offer full bath access. Residents are allowed to share a room if they choose. 2. Managed facilities cannot require tenants to share units. 3. All units must include a full bath. 4. Fire safety falls under the jurisdiction of the Department of Public Health. 5. No requirements for Alzheimer's SCUs. 6. All staff members must have at least eight hours of dementia and Alzheimer's disease training prior to contact with a resident. Additional monthly training may be required in the field of pain recognition and management.
Delaware ²⁵⁶	<ol style="list-style-type: none"> 1. Kitchens must be made available to residents either in their private room or in a shared area. Private units must provide at least 100 square feet per resident, and semi-private at least 80 square feet per resident. 2. No more than two residents per room.

²⁵⁴ Ibid., 23-24.

²⁵⁵ Ibid., 26-27.

²⁵⁶ Ibid., 31-32.

State	Specifications
	<ol style="list-style-type: none"> 3. At least one full bathroom for every four residents. 4. Facilities must implement a fire safety plan for emergencies. Evacuation plans must be approved by a fire marshal. Fire preventions are required in all facilities. 5. SCUs must gain approval for any treatment or care from the State. 6. Each facility must have a DON (Director of Nursing) who is also a RN (Registered Nurse). There should also be sufficient staffing to accommodate the all needs of all the residents.
District of Columbia ²⁵⁷	<ol style="list-style-type: none"> 1. Assisted Living Residences (ALR) must provide living, dining, therapy, and recreational activities. 2. Community Residence Facilities (CFR) can have no more than four residents per unit. 3. In CRF settings, groups of residents share one toilet, lavatory, and bathing facility. Groups are typically six people. In ALRs, a full bathroom is required for every six residents. 4. Rooms above the second floor must have two different exit points that are clear and can lead to the exterior of the building. Additional regulations for ALFs and CRFs can be found under the DC Building Code (DCMR Title 12). 5. None specified. 6. Staff members must complete a minimum of twelve hours of training on cognitive impairment and other related disorders.
Florida ²⁵⁸	<ol style="list-style-type: none"> 1. Private resident units must provide at least 80 square feet of usable space. Semi-private units must provide at least 60 square feet per person. An additional 35 square feet of living space is required for semi-private units.

²⁵⁷ Ibid., 35-36.

²⁵⁸ Ibid., 40-41.

State	Specifications
	<ol style="list-style-type: none"> 2. Prior to 1999, a maximum of six residents per unit. After 1999, a maximum of two residents per unit. 3. A shared bathroom can accommodate no more than six residents. The bathroom must include a sink and toilet. Bathing facilities can accommodate no more than eight residents. 4. Fire safety must comply with the fire marshal as well as the NFPA Life Safety Code. After 2011, ALFs with 17 or more beds must have an automatic defibrillator. 5. SCU physical environments must provide safety and security, appropriate activities, and 24-hour trained staff for the residents' welfare. 6. SCU staff must complete an eight hour approved course prior to employment and four hours of CE per year.
Georgia ²⁵⁹	<ol style="list-style-type: none"> 1. Personal Care Homes (PCHs) and Assisted Living Communities (ALCs) must provide at least 80 square feet per resident as well as secured outdoor spaces, high visual contrasts between floor and walls and doorways and ways, individual identified doors, and automated devices for system of alert. 2. PCHs can have no more than four residents per unit. ALCs can have no more than two residents per unit. 3. PCHs must provide a common toilet, lavatories, and bathing facilities. ALCs must have separate toilet and lavatories for staff and residents. 4. Facilities with seven or more residents must follow state fire regulations, including installing sprinkler systems. ALCs must have smoke detectors hardwired to the electrical box with back up battery. 5. Memory care units must follow requirements that include physical design, environment, and safety, staffing and training, and

²⁵⁹ Ibid. 45-46.

State	Specifications
	<p>therapeutic activities. Facilities that care for residents with wandering issues must also have safety devices on doors, current pictures of residents on file, and properly trained staff.</p> <p>6. Staff members must be trained in elopement procedures; the facility's philosophy of care for residents with dementia; Alzheimer's disease and other dementias; common behavior problems and management techniques; therapeutic intervention and activities; environmental modifications that create a more therapeutic environment; and maintaining residents safety among other things.</p>
Hawaii ²⁶⁰	<p>1. Apartment units must provide at least 220 square feet, not including bathroom; a cooking capacity; a separate and complete bathroom with a sink, shower, and toilet; and a monitored call system among other things.</p> <p>2. Not specified.</p> <p>3. Must comply with the IBC as well as county fire authorities.</p> <p>4. Not specified.</p> <p>5. Not specified.</p> <p>6. Not specified.</p>
Idaho ²⁶¹	<p>1. Private units must have at least 100 square feet and shard units must have a minimum of 80 square feet per resident.</p> <p>2. No more than two residents per residential unit.</p> <p>3. At least one toilet for every six residents.</p> <p>4. All Residential Care (RC) facilities and ALFs are required to have smoke detectors and fire alarm systems. Facilities with 17 or more residents must install commercial grade fire sprinklers.</p> <p>5. The facility must provide an interior environment and an exterior</p>

²⁶⁰ Ibid., 49-50.

²⁶¹ Ibid., 53-54.

State	Specifications
	<p>yard that is secure and safe.</p> <p>6. Staff members must be trained in communication, transition assistance, ADLs, stress reduction, and behavioral management.</p>
Illinois ²⁶²	<ol style="list-style-type: none"> 1. Assisted living and shared housing must comply with the NFPA Life Safety Code. 2. Assisted living and shared housing units are individual units except in cases in which residents chose to share a unit. 3. At least one tub or shower for every six residents, and at least one toilet and sink for every four residents. All assisted bathrooms must provide privacy, a toilet, sink, mirror, means of ventilation, and assistive devices. 4. Assisted Living facilities and shared housing establishments must comply with the NFPA Life Safety Code 101. 5. Alzheimer's Unit Requirements <ol style="list-style-type: none"> 5.1. Regulated Information disclosure; 5.2. A representative designated for each resident; 5.3. Safety for all residents, including those who wander; 5.4. Proper communication with resident, representative, and friends and family; 5.5. Individualized cognitive stimulation; 5.6. An appropriate number of staff; and 5.7. At least 1.4 hours of services per resident per day. 6. All staff members must receive normal training plus four hours of dementia-specific orientation prior to employment. Training must include basic dementia and Alzheimer's information, techniques for minimizing behavioral issues, general safety risks and management, communication techniques, and resident rights.
Indiana ²⁶³	<ol style="list-style-type: none"> 1. Private units must at least 100 square feet and semi-private units

²⁶² Ibid., 58-59.

State	Specifications
	<p>at least 80 square feet per resident. Facilities should provide common areas such as dining, activity, and lounge rooms.</p> <ol style="list-style-type: none"> 2. No more than four beds per unit. 3. Each unit must have a private toilet, lavatory, and tub or shower. 4. No life code provided. All facilities must follow the Indiana State Department of Health Residential Care Facility rules. 5. Dementia Care Facility must have a disclosure statement that includes: <ol style="list-style-type: none"> 5.1. "The mission or philosophy concerning the needs of residents with dementia; 5.2. The criteria used to determine that a resident may move into an SCU; 5.3. The process for the assessment, establishment, and implementation of a plan for special care; 5.4. Information about staff including number of staff available and training provided; 5.5. The frequency and types of activities for residents with dementia; 5.6. Guidelines for using physical and chemical restraints; 5.7. An itemization of the health facility's charges and fees for special care; and 5.8. Any other features, services, or characteristics that distinguish the care provided in special care." 6. Along with normal training, staff must receive at least six hours of dementia-specific training within the first six months as well as three hours annual training.
Iowa ²⁶⁴	<ol style="list-style-type: none"> 1. Private units must be at least 240 square feet. Semi-private units must be at least 340 square feet.

²⁶³ Ibid., 63-64.

²⁶⁴ Ibid., 70-71.

State	Specifications
	<ol style="list-style-type: none"> 2. A maximum of one resident may live in a single occupancy unit. One or two residents may live in a double occupancy apartment. 3. Each resident must have a bathroom with a sink, toilet, and bathing facilities. 4. All facilities are required to have sprinklers and smoke detectors. All facilities must also follow the NFPA 101. Smoke detectors must be installed in all livable spaces. 5. Operational alarm systems must be installed on all exit doors in a dementia-specific program. Staff members must also have the ability to disable or remove the lock on an entrance door. 6. Staff members must receive dementia-specific training for at least eight hours before employment and again annually.
Kansas ²⁶⁵	<ol style="list-style-type: none"> 1. Facilities must contain a living area, storage area, full bath, kitchen, and lockable door. 2. None specified. 3. None specified. 4. All licensed residential health care and assistive living facilities must meet the NFPA 101 Life Safety Code, 2006 edition. 5. Staff must be trained on treatment of behavioral symptoms. 6. "Before assignment to the special care section or facility, each staff member must be provided with a training program related to the specific needs of the residents to be served and evidence of completion of the training is to be maintained in the employee's personnel records."
Kentucky ²⁶⁶	<ol style="list-style-type: none"> 1. Private and dual occupancy units must be a minimum of 200 square feet. Each unit must have a lockable door, a window to the outdoors, a phone jack, thermostat control, a private bathroom

²⁶⁵ Ibid., 74-75.

²⁶⁶ Ibid., 76-77.

State	Specifications
	<p>with tub or shower. Units must also have access to the dining, laundry facility, and central living room.</p> <ol style="list-style-type: none"> 2. No more than two residents per unit. 3. Each living unit must provide a private bathroom equipped with tub or shower for five residents. 4. Annual inspections are required in the following fields: fire, health, elevator, HVAC, food, and occupancy. 5. Assisted living that offers special care will provide anyone interested details about any special programs, staffing, or training. 6. Facilities that offer special care must have on file details about their training, especially dementia-specific training, and what is included and required by which involved staff members.
Louisiana ²⁶⁷	<ol style="list-style-type: none"> 1. Studio units must be at least 250 square feet, excluding bathrooms and storage. Living units with separate bedrooms must have at least 190 square feet of living area, excluding bedroom, bathroom, and storage. Each bedroom must have a minimum of 120 square feet, excluding bathroom and storage. 2. No more than two residents per unit. 3. Facilities must provide public restrooms of sufficient number and location to serve residents and visitors. 4. All new construction must have sprinklers and smoke detectors in accordance with NFPA, 101 Life Safety Code, 20013. All new construction must follow the 2006 IBC. 5. If a facility acquires a resident that wanders, they are required to provide an enclosed area that allows them to go outside safely. 6. Staff members are required to undergo at least eight hours of training in dementia care annually.
Maine ²⁶⁸	<ol style="list-style-type: none"> 1. Private unit bedrooms must be at least 100 square feet. Share

²⁶⁷ Ibid., 79-80.

State	Specifications
	<p>unit bedrooms must provide at least 80 square feet per residents.</p> <ol style="list-style-type: none"> 2. No more than two residents per unit. 3. Shared bathrooms are allowed as long as the toilet to residents is 1:6. Bathing facilities max usage is 1:15. 4. Each facility will follow the state fire marshal's office for life safety as well as the NFPA Life Safety Code. 5. Alzheimer's/dementia care units must offer special weekly activities to evoke motor skills, self-care, social, outdoor, and sensory enhancements. 6. Staff must receive training prior to engaging with residents.
Maryland ²⁶⁹	<ol style="list-style-type: none"> 1. Private rooms must have a minimal of 80 square feet of function space. Semi-private rooms must have a minimal of 120 square feet. 2. A maximum of two residents per unit. 3. Facilities must provide on toilet for every four residents and one shower/bath room for every 8 residents. Bathrooms must provide privacy hardware for each resident. 4. Facilities must abide by the NFPA, 101 Life Safety Code and must have fire prevention devices such as smoke detectors, fire extinguishers, and sprinklers installed in the facility. Each resident room must have a smoke detector. Quarterly fire drills are required. Newer facilities with 50 or more residents must have a backup generator capable of running for 48 hours. 5. Facilities that house older adults with Alzheimer's must submit a disclosure statement for residents with Alzheimer's. Special daily programs and services must also be established for the residents. 6. At least five hours of training in cognitive impairment and mental illness is required during the first three months. At least two hours

²⁶⁸ Ibid., 82-83.

²⁶⁹ Ibid., 87-89.

State	Specifications
	of continued training must be provided annually.
Massachusetts ²⁷⁰	<ol style="list-style-type: none"> 1. Facilities must provide either a single or double occupancy unit with lockable doors 2. No more than two residents per unit. 3. Each living unit must provide a private bathroom equipped with one sink, one toilet, and one bath/shower. Larger facilities must provide at least one full bathroom per three residents. 4. Massachusetts does not have any special life safety codes. However they must follow all applicable state and federal regulations. 5. A facility must obtain certification as a Special Care Residence. Requirements include policies, procedures, training, and care. 6. All staff members must receive at least two hours of training on dementia or cognitive impairment. In addition, all staff must receive at least two hours additional training per year.
Michigan ²⁷¹	<ol style="list-style-type: none"> 1. HFAs (Homes for the Aged) must provide at least 80 square feet for private units and 70 square feet for shared units. AFC (Adult Foster Care) must provide at least 80 square feet for single units and 65 square feet for multi-bed units. 2. For HFAs, no more than four residents per unit. For AFC, no more than two residents per unit. 3. For HFAs, at least one sink and toilet for every eight residents. For AFC at least one sink, toilet, and bathing facility per floor. 4. HFAs must comply with fire safety rules for health care facilities. AFC that care for more than seven residents must follow regulations set by the Bureau of Fire Services. 5. HFAs and AFC must provide a written description that describes

²⁷⁰ Ibid., 93-94.

²⁷¹ Ibid., 98-99.

State	Specifications
	<p>at least, and not limited to, the following:</p> <ol style="list-style-type: none"> 5.1. Philosophy and mission statement that reflect the needs of residents with Alzheimer's and dementia. 5.2. Criteria for move-in, transfer, discharge. 5.3. Resident assessment and plan of care process. 5.4. Staff training and CE practices. 5.5. Appropriate supporting physical environment and design features. 5.6. Activity description for Alzheimer's and dementia residents. 5.7. Fees related to services for residents with Alzheimer's. 6. There are no specific requirements for dementia care, but all staff must be trained and competent to meet the needs of every resident.
Minnesota ²⁷²	<ol style="list-style-type: none"> 1. Facilities must comply with state and local building codes. 2. Facilities must comply with state and local building codes. 3. Existing facilities must comply with the International Fire Code plus Minnesota amendments. 4. Facilities that house residents with dementia must have a secure establishment. 5. Written disclosure must include the philosophy of care, who can be accepted into the SCU, staffing details, how the facility will meet the needs of the residents, the process for resident assessment and service plan design, physical design and security measures, programs and activities details, family involvement, and fee schedules and agreements for additional services. 6. Supervisors and staff members must be trained in dementia care. They must also be trained in other related disorders, assist with ADLs, problem solving for challenging behaviors, and communication skills.

²⁷² Ibid., 104-105.

State	Specifications
Mississippi ²⁷³	<ol style="list-style-type: none"> 1. Private and shared units must provide at least 80 square feet per resident. 2. No more than four residents per unit. 3. Separate toilets and bathing facilities for each sex. At least one bathtub/shower for every twelve residents. At least one sink and toilet for every six residents. 4. All care facilities must have automatic fire sprinklers and comply with the NFPA. Smoke detectors must be installed in each hallway no more than 30 feet apart. All facilities built after 2005 must be constructed to have one hour fire resistance rating. 5. A RN or LPN must be present at all times. Minimum requirements are based on a ratio of three hours of nursing care per resident per 24 hours. Facilities may only house residents up to stage II Alzheimer's. A licensed social worker, counselor, or marriage and family therapist must provide at least eight hours per month of service and support to residents and families. 6. Quarterly ongoing training must be provided to all staff in direct contact with residents covering at least three of eight topics.
Missouri ²⁷⁴	<ol style="list-style-type: none"> 1. Both ALF and RCF units must provide at least 70 square feet per resident. 2. For both ALFs and RCFs, no more than four residents per unit. 3. Both ALFs and RCFs must have at least one tub or shower for every 20 residents and at least one toilet and sink for every six residents. 4. Both ALFs and RCFs must follow the NFPA 1010 Section 18.3. 5. Both ALFs and RCFs must disclose how this Alzheimer's care unit differs from the rest of the facility. The information must include the philosophy/mission, the move-in/transfer/discharge process,

²⁷³ Ibid., 108-109.

²⁷⁴ Ibid., 115-116.

State	Specifications
	<p>staff training, types of resident activities, cost of care and additional fees, and safety measures.</p> <p>6. Both ALFs and RCFs must provide at least three hours orientation training for those who provide direct care as well as ongoing in-service training.</p>
Montana ²⁷⁵	<ol style="list-style-type: none"> 1. Private units must provide at least 100 square feet and semi-private units, at least 80 square feet per resident. 2. No more than four residents per unit. 3. At least one toilet for every four residents. At least one bath/shower for every twelve residents. 4. All facilities must follow NFPA standards. Based on the Clean Air Act, smoking on any public facility is prohibited. All facilities must have automated sprinklers and smoke detectors in resident rooms. 5. All facilities offering special care require additional staff training and specialized accommodations and must disclose information on philosophy/mission regarding dementia care,, move-in/transfer/discharge process, resident assessment, staff training, resident activities, family involvement, and additional fees. 6. Staff training must be documented and cover ADLs, techniques for minimizing challenging behavior, therapeutic programming, promoting dignity and independence, medication side effects, and techniques for dealing with incontinence.
Nebraska ²⁷⁶	<ol style="list-style-type: none"> 1. For private units, at least 80 square feet and for shared units, at least 60 square feet per resident. 2. No more than four residents per unit in existing structures. In new structures, no more than two residents per unit.

²⁷⁵ Ibid., 121-122.

²⁷⁶ Ibid., 126-127.

State	Specifications
	<ol style="list-style-type: none"> 3. New facilities must provide one bathing facility for every eight residents. Facilities must have a toilet and sink in adjoining bedrooms. 4. Facilities must follow NFPA codes and standards and comply with Nebraska state fire codes and standards. 5. Facilities that house residents with Alzheimer's and dementia must provide proper care and service. There must be a written document explaining move-in, discharge, transfer, and resident conduct. A sufficient number of trained direct care staff must be maintained the living environment provided must accommodate the specific needs involved. 6. Staff members must be trained in Alzheimer's- and dementia-specific care. The facility must provide a minimum of four hours annually of CE training consisting of skills and knowledge necessary for care.
Nevada ²⁷⁷	<ol style="list-style-type: none"> 1. Private units must provide at least 80 square feet and shared units, at least 60 square feet per resident. 2. No more than three residents per resident unit. 3. A toilet and lavatory must be provided for every four residents and a tub/shower for every six. 4. All facilities must practice fire drills, have smoke detectors, and sprinklers. 5. Eight hours of training is required for staff members before interacting with residents. Locked quarters are allowed in Alzheimer's units. Audible devices such as buzzers and alarms are required on all exit doors to alert the nurses on duty of someone escaping. 6. Each employee is required to have at least two hours within the first 40 hours of employment with an additional eight hours of

²⁷⁷ Ibid., 130-131.

State	Specifications
	training per year.
New Hampshire ²⁷⁸	<ol style="list-style-type: none"> 1. For facilities with less than sixteen residents, at least 80 square feet for private units and 160 square feet for semi-private units. For facilities with more than seventeen residents, at least 100 square feet for private units and 80 square feet per resident for semi-private units. 2. No more than two residents per unit. 3. At least one sink, toilet, shower/tub for every six residents. 4. Smoke detectors must be hardwired in every room. Carbon monoxide and ABC-type fire extinguishers are required on every floor. Facilities must comply with the 2009 NFPA 101 Life Safety Code and IBC. 5. Locked and secured buildings are prohibited for all ALF. 6. Licenses must provide staff with training that meets the needs of the resident.
New Jersey ²⁷⁹	<ol style="list-style-type: none"> 1. Private units must be at least 150 square feet and semi-private, a combined minimum of 160 square feet. 2. No more than two residents per unit. 3. Each resident unit must have a toilet, shower/tub, and sink. 4. Smoke detectors are required for all residents. All facilities must comply with NFPA standards. 5. Alzheimer's unit are required to establish a written statement of policies and procedures for the unit that include such information as discharge, staff training, lists of activities, and safety policies. 6. Staff are required to attend a mandatory training program.
New Mexico ²⁸⁰	<ol style="list-style-type: none"> 1. Private units must be at least 100 square feet and semi-private, at

²⁷⁸ Ibid., 135-136.

²⁷⁹ Ibid., 141

²⁸⁰ Ibid., 144.

State	Specifications
	<p>least 80 square feet per resident.</p> <ol style="list-style-type: none"> No more than two residents per unit. At least one toilet, sink, and shower/tubs for every eight residents. Manual fire alarm systems are required. Smoke detectors and battery backup are required for each floor. Smoke detectors are required in spaces greater than 35 feet. Facilities must provide sufficient number of trained staff members to meet the additional needs of residents. A minimum of twelve hours of training per year on topics related to dementia and Alzheimer's.
New York ²⁸¹	<ol style="list-style-type: none"> Facilities can be either private or semi-private units. No more than two residents per unit. At least one toilet, lavatory, shower/tub for every three residents. Facilities must comply with the Building Code of New York, modeled after the IBC. Smoke detector systems must be installed throughout the building. Special requirements exist for dementia units. Staff training should include methods for meeting the residents' needs.
North Carolina ²⁸²	<ol style="list-style-type: none"> Private units must be at least 100 square feet and semi-private, at least 80 square feet per resident. No more than two residents per unit. At least one toilet and sink for every five residents. At least one shower or tub for every ten residents. In adult care homes, smoke detectors must be in all corridors no more than 60 feet from each other. After 2000, additional staffing and staff training in dementia care

²⁸¹ Ibid., 149-150.

²⁸² Ibid., 155-156.

State	Specifications
	<p>and disclosure statement on policies and services are required.</p> <p>6. Six hours of orientations within the first week of employment.</p> <p>Twenty hours of dementia-specific training within six months of employment and twelve hours of continuing education.</p>
North Dakota ²⁸³	<ol style="list-style-type: none"> 1. Private units must be at least 100 square feet and semi-private, at least 80 square feet per resident. 2. No more than two residents per unit. 3. Common toilets, lavatories, and bathing facilities are permitted. In basic care facilities, at least one toilet for every four residents and one bath or shower for every fifteen. 4. Facilities must comply with the NFPA 13D, 13R, NFPA 13. Smoke detectors are required in resident rooms, corridors, and common areas. Sprinklers system must be installed in all facilities. 5. Alzheimer's units are available in basic care facilities. They are not available in assisted living facilities. 6. None specified.
Ohio ²⁸⁴	<ol style="list-style-type: none"> 1. Private residents must be a minimum of 100 square feet and shared must have a minimum of 80 square feet per residents. 2. No more than two residents per unit. 3. One toilet, lavatory, shower/tub for every eight residents. 4. Sprinklers and smoke detectors required since 1974. Facilities must comply with the International Fire Code and the NFPA. 5. Facilities that house residents with Alzheimer's and dementia must provide proper care and service. There must be a written document explaining move-in, discharge, transfer, resident conduct, nursing requirements, and physical environment specifics.

²⁸³ Ibid., 159-160.

²⁸⁴ Ibid., 163-164.

State	Specifications
	6. Staff members must receive special training prior to interaction with residents.
Oklahoma ²⁸⁵	<ol style="list-style-type: none"> 1. Design must be appropriate to meet the needs of the residents with mental or physical disabilities. 2. No more than two residents per unit. 3. At least one shower or bath for every four residents. 4. Facilities must comply with the NFPA Life Safety Code as well as the IBC. Sprinklers and smoke detectors are required. 5. If a facility contains an SCU, it must state this and disclose what type of services it offers. 6. Staff members must be specialized and trained to meet the specialized needs of residents.
Oregon ²⁸⁶	<ol style="list-style-type: none"> 1. At least 220 square feet per unit. 2. No more than two residents per unit. 3. Private bathrooms are required in ALFs. 4. All buildings must have automated sprinkler systems, smoke detectors, and manual fire alarms. 5. In 2010, Oregon developed new rules for the endorsement of Memory Care Communities, formerly known as Alzheimer's Care Units. To achieve endorsement, a community must meet underlying licensing requirements for Assisted Living and Residential Care as well as the endorsement requirements. 6. Staff members must receive four hours of dementia specific training annually with an additional ten to twenty hours annually of dementia-specific CE.
Pennsylvania ²⁸⁷	1. For ALRs (Assisted Living Residences), private units must be at

²⁸⁵ Ibid., 167-168.

²⁸⁶ Ibid., 173-174.

²⁸⁷ Ibid., 182-187.

State	Specifications
	<p>least 225 square feet, excluding bathrooms and storage. Semi-private units must be at least 300 square feet.</p> <ol style="list-style-type: none"> 2. No more than two residents per unit with agreement. 3. ALR bathrooms must be equipped with a toilet, lavatory, and shower/tub. For double-occupancy rooms, bathrooms must be lockable unless not supported in contract. 4. All ALRs must have at least two exits. Fire extinguishers and pull signals must be posted in conspicuous and public spaces. Smoke detectors and automated sprinkler systems must be installed. 5. ALRs may establish their own standards for SCUs as long as they cover specialized care and service for residents and neurobehavioral rehabilitation. Admission to such facilities must be through consultation with a designated person. All facilities must have electronic or magnetic locking systems and smoke or heat detectors. 6. Six hours of annual dementia-specific training.
Rhode Island ²⁸⁸	<ol style="list-style-type: none"> 1. Private units must be at least 100 square feet and semi-private units at least 160 square feet. 2. No more than two residents per unit. 3. At least one bath for every ten residents and one toilet for every eight. 4. Facilities must have sprinklers and smoke detectors. Carbon monoxide detectors must be hardwired or wireless and must be installed in accordance with the NFPA 720. 5. SCUs and programs must disclose the following information: philosophy of care; pre-occupancy, occupancy, and termination, assessment; staffing and training requirements; physical environment; resident activities; family role in care; and program costs.

²⁸⁸ Ibid., 194-195.

State	Specifications
	<ol style="list-style-type: none"> Staff members must have at least twelve hours of orientation and training in understanding the various types of dementia, communicating, and managing behaviors.
South Carolina ²⁸⁹	<ol style="list-style-type: none"> Private units must have at least 100 square feet and shared units, at least 80 square feet per resident. No more than three residents per unit. At least one toilet for every six residents and one tub/shower for every eight. Facilities must comply with the 2006 IBC. Any additions or renovations must meet the codes, regulations, and requirements for the building. Facilities offering SCUs or programs for residents with Alzheimer's disease must disclose care and treatment. Staff members must be trained by a licensed staff member through books or tapes. Training should cover the needs of the residents in that facility.
South Dakota ²⁹⁰	<ol style="list-style-type: none"> Private units must be at least 120 square feet and semi-private units, at least 100 square feet. Exit alarms must be installed for cognitively impaired residents. Call systems must also be installed for physically impaired residents. No more than two residents per unit. Bathrooms must be installed adjacent to each other. Bathrooms must include a toilet, sink, and lavatory. Facilities must comply with the 2009 edition of the Life Safety Code. All newly constructed facilities must have automatic sprinkler systems, fire alarms, and smoke detection systems based on occupancy classification, which must be installed based

²⁸⁹ Ibid., 199.

²⁹⁰ Ibid., 202-203.

State	Specifications
	<p>on NFPA rules.</p> <ol style="list-style-type: none"> Each facility with secured units must comply with the following: obtain physician's order for confinement of the residents and plan for review, provide and document therapeutic programming, confinement may not to be used as punishment or for staff convenience, detail and assess resident's need for confinement and communicate this to family, comply with the Life Safety Code regarding locked doors, and meet staff quantity and training requirements. Staff members on an SCU floor must have specific training and must be on duty at all times.
Tennessee ²⁹¹	<ol style="list-style-type: none"> At least 80 square feet must be provided for each resident. No more than two residents per unit. At least one toilet, sink, bath/tub for every six residents. All facilities must follow the 2006 IBC, 2006 NFPA, 2005 National Electrical Code, 2005 US Public Health Service Food Code, 2004 ADA. Facilities with secured units must provide to survey staff specific information and documentation accumulated during the previous twelve months regarding staffing patterns, care provided, and health-related issues. All staff members on a secured floor must have annual in-service training. Training must cover basic Alzheimer's and dementia-related disorders, dealing with mental behaviors, identifying safety risks, ADLs, and proper methods of communication with families and guardians of the resident.
Texas ²⁹²	<ol style="list-style-type: none"> Private units be at least 80 square feet and shared units, at least

²⁹¹ Ibid., 206-207.

²⁹² Ibid., 210-211.

State	Specifications
	<p>60 square feet per resident.</p> <ol style="list-style-type: none"> 2. No more than four residents per unit. No more than 50 percent of the facility may have more than two residents. 3. All bedrooms must be served by separate private/connecting/general toilet rooms for each gender. At least one toilet and sink for every six residents and one tub/shower for every ten residents. 4. Facilities must have fire alarms and smoke detectors. 5. The facility must provide a disclosure statement that describes the nature of its care or treatment of residents with Alzheimer's disease and related disorders. 6. Staff members in an Alzheimer's-certified ALF must complete twelve annual hours of in-service education regarding Alzheimer's disease.
Utah ²⁹³	<ol style="list-style-type: none"> 1. Private units must be at least 120 square feet. and semi-private units, at least 200 square feet. 2. No more than two residents per unit. 3. Common toilet, lavatory and bathing facilities are permitted. 4. Facilities must comply with the IBC for construction and IFC for fire safety. Fire sprinklers are required in all facilities over 4,500 square feet. Smoke detectors are also required throughout all facilities. 5. Type II facilities may admit residents with Alzheimer's or dementia "if the resident is able to exit the facility with limited assistance from one person." 6. There must be at least one staff with documented training in Alzheimer's/dementia care in the secured unit at all times.
Vermont ²⁹⁴	<ol style="list-style-type: none"> 1. Private units must be at least 225 square feet.

²⁹³ Ibid., 213-214.

²⁹⁴ Ibid., 217-218.

State	Specifications
	<ol style="list-style-type: none"> 2. All resident units must be single-occupancy unless a resident voluntarily chooses to share the unit. 3. Each resident unit must have a private bathroom. 4. Facilities must comply with the 2006 edition of the NFPA Life Safety code. Smoke detectors and fire sprinklers are required in all facilities. 5. SCUs must disclose the following information: philosophy of care, purpose, scope of service, organizational structure of the unit, description of the physical environment, criteria for admission/transfer/discharge, and staffing qualifications. 6. Staff members must be trained in communication skills specific to persons with Alzheimer's disease.
Virginia ²⁹⁵	<ol style="list-style-type: none"> 1. Private units must be at least 100 square feet and semi-private units, at least 80 square feet per resident. 2. No more than two residents per unit. 3. There must be at least one tub/shower for every seven residents and at least one toilet and sink for every four residents. There must be separate bathrooms for genders. 4. A written plan for fire and emergency evacuation is required. Fire and emergency plan drawings must be posted in all facilities. Fire and emergency drills must be performed in accordance with the current edition of the Virginia Statewide Fire Prevention Code. ALFs must comply with the sprinkler and smoke detector requirements of the appropriate building and/or fire codes including the International Fire Code. 5. At least two direct care staff members must be in the SCU at all times, with an exception allowing one staff person in the unit under specified circumstances. 6. Direct staff and administrator must complete four hours of training

²⁹⁵ Ibid., 221-222.

State	Specifications
	in cognitive impairments within two months of employment. There are also annual training requirements for direct care staff.
Washington ²⁹⁶	<ol style="list-style-type: none"> 1. Private units must be at least 80 square feet and shared units, at least 70 square feet per resident. 2. No more than four residents per unit for ALFs licensed before July 1, 1989. For those licensed after, no more than two residents per unit. 3. At least one toilet and sink for every eight residents and one bath/shower for every twelve. 4. All facilities must comply with NFPA 72. All facilities built after 2004 must provide emergency lighting in all areas. 5. All ALFs that serve residents with dementia must disclose the following information: provisions for leaving the unit, whether the unit meets fire codes, that visitors can exit without sounding an alarm, provisions for appropriate outside security door, and details about ADLs, IADLS, and group activities. 6. If an ALF serves residents with dementia, the facility must provide specialized training with specific learning outcomes to the staff that work with those residents.
West Virginia ²⁹⁷	<ol style="list-style-type: none"> 1. An ALR (Assisted Living Residence) private unit must be at least 80 to 100 square feet and semi-private unit, at least 60 to 90 square feet per resident. 2. No more than two residents per unit. 3. Common toilet, lavatory, and bathing facilities are permitted. 4. Facilities must comply with the NFPA 13D or 13R sprinkler system. All facilities must have smoke detectors in all corridors and rooms.

²⁹⁶ Ibid., 227-228.

²⁹⁷ Ibid., 232-233.

State	Specifications
	<ol style="list-style-type: none"> 5. A separate license must be obtained if a facility is taking care of residents with dementia or Alzheimer's disease. 6. For facilities, all staff must go through an initial and then annual two-hour training related to dementia and dementia care. For facilities that have an Alzheimer's unit or program, a minimum of 30 hours of training on related topics of care is required.
Wisconsin ²⁹⁸	<ol style="list-style-type: none"> 1. CBRFs (Community-Based Residential Facilities) require at least 60 to 100 square feet per resident depending on the license classification (ambulatory or semi-ambulatory). 2. No more than two residents per unit. 3. At least one toilet, sink, and tub for every ten residents. 4. CBRFs must determine an evacuation plan and must maintain a minimum of two exits. Fire extinguishers and smoke and heat detection systems are required on every floor. 5. A CBRF that admits residents with dementia must include a full description of residents' needs and how these will be met as part of the licensing process. Structured activity programs must be integrated into daily routines. 6. The ratio of staff to residents must be adequate to meet the needs of residents as defined in their assessments and individual service plans.
Wyoming ²⁹⁹	<ol style="list-style-type: none"> 1. Private units must be at least 120 square feet and semi-private units, at least 80 square feet per resident. 2. No more than two residents per unit. 3. At least one toilet and sink for every two residents and one tub or shower for every ten residents. 4. Facilities must comply with the NFPA 101 Life Safety Code and

²⁹⁸ Ibid., 238-239.

²⁹⁹ Ibid. 244-245

State	Specifications
	meet NFPA 13 rules regarding installation of sprinklers systems and fire alarms.
	5. Wyoming allows secure dementia units under a tiered licensing system with requirements that include admission/discharge, assessment, background check, and staff training.
	6. Staff members must complete at least 48 hours or 72 quarter-system hours of post education in healthcare, elderly care, facility management, etc.

From this review, it is clear that there are many similarities in how each state regulates care for its elders. For example, the square footage of private and semi-private units are fairly similar. By having a set square footage for residents, facilities may use a modular design that can maximize the floor plan. However, similar floor plan designs may also confuse wandering residents.

Another area of similarity between state regulations is adherence to the Life Safety Code, established by the National Fire Protection Association. This is a set of requirements designed to protect those in the facility and to provide a certain level of fire safety. It includes rules and regulations covering fire sprinkler spacing, smoke detection, heat detection, and panic.³⁰⁰

The author contends that security is one of the most important design elements of Dementia Care Facility guidelines for Hawai'i. The challenge, however, is to find ways to integrate proper security measures without making a facility seem too institutional. Using a buzzer system rather than an alarm can allow staff members to reach the escaping residents without the intensity that alarms add to a situation. A feature that the Plazas integrated into its designs

³⁰⁰ 2013. "Life Safety Code Requirements." *CMS.gov*. April 10. Accessed September 20, 2015. <https://www.cms.gov/Medicare/Provider-Enrollment-and-certification/CertificationandComplianc/LSC.html>.

was to match all fire exit doors with resident unit doors. These doors were also placed along the corridor, mixed in with resident unit doors, rather than at the end. Elevator doors were also camouflaged to prevent wandering residents from escaping.

Restroom and shower room design is another important element of Dementia Care Facility design because these are the rooms where the most accidents happen. Without the proper lighting and space provision, injury can occur. In many states, permitting or licensing officers will look at is the number of toilets, sinks, and shower/tubs available and allocated per resident. One interesting observation: some states require sliding pocket doors rather than traditional swinging doors in restrooms.

Staff training is another important element of Dementia Care Facility guidelines. Staff training is central to the well-being of older adults in a care facility. Staff that are trained in areas such as basic Alzheimer's and dementia-related disorders, dealing with mental behaviors, identifying safety risks, ADLs, and proper communication with families and other persons interested in the resident, can become better nurses or administrators and provide a better level of care, based in respect and dignity, to all residents.

Bibliography

- A Place For Mom. 2014. *Continuing Care Retirement Communities*. January 4. Accessed March 19, 2015. <http://www.aplaceformom.com/senior-care-resources/articles/continuing-care-retirement-communities>.
- About Home. 2012. *Choosing the Right Type of Door Knob and Lock*. Accessed February 21, 2016. <http://homerepair.about.com/od/interiorhomerepair/ss/Choosing-The-Right-Type-Of-Door-Knob-And-Lock-Set.htm>.
- Administration on Aging . 2010. "65+ Minority Population Comparison using Census 2000 and Census 2010." *U.S. Population by Age*. July. Accessed February 23, 2015. http://www.aoa.acl.gov/Aging_Statistics/Census_Population/census2010/index.aspx.
- Aging, Executive Office on. 2013. "Hawai'i 2025: State Plan on Alzheimer's disease & Related Dementia." December. Accessed March 21, 2015. http://www.hawaiiadrc.org/Portals/_AgencySite/docs/ADRD_rev.pdf.
- Alzheimer's Association. 2014. *10 Early Signs and Symptoms of Alzheimer's*. Accessed March 2, 2015. http://www.alz.org/alzheimers_disease_10_signs_of_alzheimers.asp#signs.
- . 2015. *2015 Alzheimer's Disease Facts and Figures*. Accessed February 25, 2015. https://www.alz.org/facts/downloads/facts_figures_2015.pdf.
- . 2014. *Alzheimer's Facts and Figures*. Accessed February 24, 2015. http://www.alz.org/alzheimers_disease_facts_and_figures.asp.
- . 2014. "Alzheimer's Facts and Figures." *Alzheimer's Association*. Accessed February 23, 2015.

http://www.alz.org/alzheimers_disease_facts_and_figures.asp#quickFacts

.

- . 2014. "Basics of Alzheimer's disease." Accessed March 5, 2015.
http://www.alz.org/national/documents/brochure_basicsofalz_low.pdf.
 - . n.d. "Music Therapy Enhancing Cognition." *Caregiver Tips & Tools*. Accessed March 7, 2015.
http://www.alz.org/cacentral/documents/Dementia_Care_9-Music_Therapy_enhancing_cognition.pdf.
 - . 2014. *Seven Stages of Alzheimer's*. Accessed March 2, 2015.
http://www.alz.org/alzheimers_disease_stages_of_alzheimers.asp.
 - . 2014. *Special Care Units*. Accessed March 19, 2015.
http://www.alz.org/join_the_cause_special_care_units.asp.
 - . n.d. *Types of Dementia*. Accessed February 20, 2015.
<http://www.alz.org/dementia/types-of-dementia.asp>.
 - . n.d. *Types of Dementia*. Accessed February 20, 2015.
<http://www.alz.org/dementia/types-of-dementia.asp>.
 - . 2014. "Wandering and Getting Lost." *Alzheimer's Association*. Accessed March 11, 2015.
http://www.alz.org/national/documents/brochure_behaviors.pdf.
 - . 2014. *What is Alzheimer's?* Accessed March 1, 2015.
http://www.alz.org/alzheimers_disease_what_is_alzheimers.asp.
 - . n.d. *Yonger/Early onset Alzheimer's and Dementia*. Accessed February 20, 2015. http://www.alz.org/alzheimers_disease_early_onset.asp.
- Alzheimer's Research Center. 2014. "Mild Cognitive Impairment Research." *Alzheimer's Research Center*. Accessed March 1, 2015.
http://alz.org/research/video/alzheimers_videos_and_media_identifying.asp?_ga=1.165625209.711427970.1421783409.

- American Foundation for the Blind. 2015. *Esther's Place Virtual Tour*. Accessed December 22, 2015. <http://www.afb.org/info/programs-and-services/center-on-vision-loss/what-we-do/esthers-place-virtual-tour/1234>.
- American Institute of Architects. 2012. *The Carbon Neutral Design Project*. Accessed January 10, 2016. <http://www.tboake.com/carbon-aia/strategies1b.html>.
- American Standard. 2016. *Dazzle 2 handle 4 Inch Centerset High-Arc Bathroom Faucet*. Accessed February 18, 2016. <http://www.americanstandard-us.com/bathroom-faucets/dazzle-two-handle-centerset-bathroom-faucet/>.
- Aralik. 2013. *Home Design And Decoration*. Accessed February 18, 2016. <http://besthomedeco.blogspot.com/2013/12/inside-decorating-kinds-that-can-use.html>.
- Architects Hawai'i Ltd. 2014. *Kahala Nui Senior Living Community*. Accessed February 20, 2016. <http://www.ahldesign.com/projects/kahala-nui-senior-living-community/>.
- areavibes. 2015. *Diamond head - Kapahulu Weather*. Accessed April 13, 2015. <http://www.areavibes.com/honolulu-hi/diamond+head-kapahulu/weather/>.
- . 2015. *Diamond Head-Kapahulu Air Quality Information*. Accessed April 15, 2015. <http://www.areavibes.com/honolulu-hi/diamond+head-kapahulu/weather/>.
- . 2015. *Waialae-Kahala Air Quality Information*. Accessed April 13, 2015. <http://www.areavibes.com/honolulu-hi/waialae-kahala/weather/>.
- Assisted Living Federation of America. 2013. *What is Assisted Living?* Accessed March 19, 2015. http://www.alfa.org/alfa/Assisted_Living_Information.asp.
- Benches5.copm. 2015. *wooden garden bench tesco*. Accessed February 12, 2016. <http://benches5.com/wooden-bench-outdoor-must-feature-weather-resistance-and-high-style/wooden-garden-bench-tesco/>.

- Berner, Linda. 2015. Accessed December 25, 2015.
<http://lindaberner.com/round-pedestal-dining-table/saving-small-dining-room-spaces-with-36-inch-solid-wood-round-pedestal-dining-table-with-flower-centerpieces-and-4-dining-chairs-on-white-carpet-tiles/>.
- Bissonnette, Thomas. 1989. *Hallucinations, Paranoia Practical Suggestins for Understanding Problem Behaviors*. Edited by Anne Robinson, Beth Spencer and Laurie White. Ypsilanti: Eastern Michigan Univeristy.
- Blaisdell, Kekuni. 2004. *Hawaii Heart*. February 2. Accessed October 9, 2015.
<http://www.hawaiiheart.com/health2.html>.
- Brawley, Elizabeth C. 1997. *Designing for Alzheimer's Disease*. New York: John Wiley & Sons, Inc.
- Calkins, Margaret P. 1988. *Design for Dementia*. Owning Mills: National Health Publishing.
- Collection, Umbrosa. 2015. *Ingena Shade Sail System*. Accessed January 3, 2016.
<http://umbrosa.shadescapesamericas.com/collections/ingenuea-shade-sail-system/products/ingenuea-sails-triangle>.
- Coppola, Gloria. 2009. *Lomilomi: The Art of Sacred and Compasionate Touch*. December. Accessed October 17, 2015.
<http://futurelmt.com/articles/massage-student-article.php?id=324>.
- Day, Julie. 2009. *How to Build a Stackable Block Retaining Wall*. Accessed February 12, 2016. <http://www.todayshomeowner.com/how-to-build-a-stackable-block-retaining-wall/>.
- Decor Link. 2016. *The Art of Window Dressing*. Accessed February 21, 2016.
<http://www.decorlink.com/window-treatments/>.
- Decoramialab. 2015. *Dimensional Forms*. April 14. Accessed March 15, 2016.
<https://noticiasdecoramialab.wordpress.com/2015/04/17/formas-tridimensionales-2/>.

- Department of Business, Economic Development and Tourism . 2012. "Population and Economic Projections for the State of Hawaii to 2040." *DBEDT 2040 Series* . March. Accessed February 25, 2015. http://files.hawaii.gov/dbedt/economic/data_reports/2040-long-range-forecast/2040-long-range-forecast.pdf.
- Department of Justice. 2010. *2010 ADA Standards for Accessible Design*. Washington D.C.: ADA.
- Department of Native Hawaiian Health. 2013. "Guide to Selected Plants of the Mala La'au Lapa'au." *‘Ōlelo Mua*. Accessed October 21, 2015. <http://www.hawaii.edu/nhcoe/wp-content/uploads/Mala-Directory-Web-Upload-Compressed1.pdf>.
- Design, Interior & Exterior Doors. 2015. *Fire rated wood doors Photo – 11*. Accessed February 9, 2016. <http://freera.org/fire-rated-wood-doors.html/fire-rated-wood-doors-photo-11>.
- Dictionary, Mosby's Medical. n.d. *Mosby's Medical Dictionary, 8th edition*. S.v. "Cognitive Function.". Accessed March 7, 2015. <http://medical-dictionary.thefreedictionary.com/Cognitive+Function>.
- DigsDigs. 2015. *38 Amazing Outdoor Water Walls For Your Backyard*. Accessed January 6, 2016. <http://www.digsdigs.com/38-amazing-outdoor-water-walls-for-your-backyard/>.
- Dr. Foster and Smith. 2015. *Sturdy Bird Feeder*. Accessed February 12, 2016. <http://www.drsofostersmith.com/sturdy-bird-feeder-th.html>.
- Eldercare. 2004. *Caregiver's Guide to Understanding Dementia Behaviors*. December 31. Accessed February 2, 2015. <https://caregiver.org/caregivers-guide-understanding-dementia-behaviors>.
- emedicine health. 2014. *CT Scan*. December 12. Accessed March 2, 2015. http://www.emedicinehealth.com/ct_scan/article_em.htm.

- Executive Office of Aging. 2011. "Hawai'i State Plan on Aging October 1, 2013 - September 30, 2015." *Executive Office of Aging*. October 1. Accessed February 26, 2015. <http://health.hawaii.gov/ea/files/2013/07/Hawaii-State-Plan-On-Aging.pdf>.
- Flashconf. 2016. *Moen Chateau In Centerset Single Handle Low Arc Bathroom Faucet Moen Bathroom Sink Faucets*. February 1. Accessed February 18, 2016. <http://flashconf.com/2016/02/01/moen-chateau-in-centerset-single-handle-low-arc-bathroom-faucet-moen-bathroom-sink-faucets/>.
- Furniture, Countryside 100% Hand-Crafted Amish. 2015. *Delray Octagon Picnic Table*. Accessed January 3, 2016. <https://www.countrysideamishfurniture.com/product/delray-octagon-picnic-table>.
- Gigi-Hawaii. 2008. *Thoughts for Monday*. July 21. Accessed February 20, 2016. <https://gigihawaii.wordpress.com/2008/07/page/2/>.
- Graham, Ben. 2012. *Natural Design/Build*. July 5. Accessed January 14, 2016. <http://benjaminfranklingraham.blogspot.com/2012/07/sbf-24-energy-star-window-ratings-and.html>.
- Harris, Cyril. 1994. *Noise Control in Buildings: A Practical Guide for Architects and Engineers*. Texas: McGraw-Hill.
- Helpguide.org. n.d. *A Guide to Nursing Homes*. Accessed March 19, 2015. <http://www.helpguide.org/articles/senior-housing/guide-to-nursing-homes.htm>.
- Hilgenkamp, Kathrn, and Collen Pescaia. 2004. "Traditional Hawaiian Healing and Western Influence." *Californian Journal of Health Promotion* 36-37.
- Home Renovation and Repairing. 2015. *How RV Bathroom Faucets Can Make Your Bathroom Look Even More Attractive?* August 15. Accessed February 18, 2016. <http://homerennovation.tumblr.com/>.

- Home Shop 18. 2016. *Magazine Rack*. Accessed February 20, 2016.
<http://www.homeshop18.com/magazine-racks/>.
- Hompaper. 2015. *Window Treatments Ideas*. Accessed February 21, 2016.
<http://hompaper.com/window-treatments-ideas/>.
- Huelat, Barbara J. 2007. "Wayfinding: Design for Understanding." *The Center For Health Design*. Accessed February 18, 2015.
<https://www.healthdesign.org/sites/default/files/WayfindingPositionPaper.pdf>.
- Huna, Acient. 2005. *The Bodies of Mankind*. Accessed October 17, 2015.
http://www.ancienthuna.com/4_bodies.htm.
- J, Triangle. 2010. *Opening a Family Care Home*. Accessed January 30, 2015.
<http://www.tjaaa.org/opening-a-family-care-home.aspx>.
- Jacques, Erica. 2009. *What Is a Progressive Disorder?* May 11. Accessed March 1, 2015.
http://pain.about.com/od/whatischronicpain/g/progressive_disorder.htm.
- Joseph, Anjali. 2006. *The Role of the Physical and Social Environment in Promoting Health, Safety, and Effectiveness in the Healthcare Workplace*. Research Findings, Concord: the Center for Health Design.
- Kavcic, Sofija. 2014. *Kakaako Community For Seniors With Alzheimer's Retrofitting Kakaako into a Versatile and All In-clusive Community*. Honolulu: University of Hawaii Press.
- Kerr Medical. 2015. *Bed Alarm System*. Accessed December 23, 2015.
http://www.kerrmedical.com/bed-alarms-economy.aspx?gclid=Cj0KEQIAqemzBRDh2vGKmMnqoegBEiQAqJPuyO8ntgjJnx_KmzGCyWN6gn64J4kBsnydRZ-4vf06JcaAIGR8P8HAQ.
- King, Serge Kahili. 2001. *Huna Kupua*. Accessed October 26, 2015.
<http://www.huna.org/html/huna.html>.

- . 2011. *What Is A Kahuna?* . Accessed October 13, 2015.
<http://www.huna.org/html/kahuna.html>.
- Kitchen, Miki's. 2011. *Lomi Lomi Salmon*. March 24. Accessed October 23, 2015.
<http://mikiskitchen.com/2011/03/24/lomi-lomi-salmon/>.
- Lawton, M. Powell. 1980. *Environment and Aging*. Monterey: Brooks/Cole.
2013. "Life Safety Code Requirements." *CMS.gov*. April 10. Accessed September 20, 2015. <https://www.cms.gov/Medicare/Provider-Enrollment-and-certification/CertificationandCompliance/LSC.html>.
- Like Cool. 2016. *Pack of Dogs*. Accessed February 20, 2016.
http://www.likecool.com/Pack_Of_Dogs--Furniture--Home.html.
- Marquard, Gesine , and Peter Schmiege. 2009. "American Journal of Alzheimer's Disease & Other Dementias." *Dementia-Friendly Architecture: Environments That Facilitate* . August/September. Accessed February 10, 2015.
http://coop4.de/02_Demografie/Pdf/Marquardt-Dementia-friendly.pdf.
- Marvin Doors. 2016. *Marvin Commercial Door*. Accessed February 9, 2016.
<http://www.marvin.com/marvin/doors/commercial>.
- Mayo Clinic Staff. 2013. *Test and Procedures MRI*. August 17. Accessed March 2, 2015.
<http://www.mayoclinic.org/tests-procedures/mri/basics/definition/prc-20012903>.
- Medicaid.gov. n.d. *Eligibility*. Accessed January 30, 2015.
<http://www.medicare.gov/Medicaid-CHIP-Program-Information/By-Topics/Eligibility/Eligibility.html>.
- Medicare.gov. n.d. *What is Medicare?* Accessed January 29, 2015.
<http://www.medicare.gov/sign-up-change-plans/decide-how-to-get-medicare/whats-medicare/what-is-medicare.html>.

- Mental Health America. 2016. *What is Paranoia?* Accessed March 20, 2016. <http://www.mentalhealthamerica.net/conditions/paranoia-and-delusional-disorders>.
- Minnesota Brain Injury Alliance. 2015. *About Brain Injury: A guide to Brain Anatomy*. April 22. Accessed December 22, 2015. <https://www.braininjurymn.org/library/AGuideToBrainAnatomy.pdf>.
- Modernfold. 2016. *Modernfold Acousti-Clear Glass Wall Partitions*. Accessed February 9, 2016. <https://www.modernfoldstyles.com/project/acousti-clear/>.
- Nagata, Kenneth. 1970. *Hawaiian Medicinal Plants*. April 13. Accessed October 19, 2015. http://www.cieer.org/geirs/regions/oc/usa_hi/ebot-46-3-241.html.
- National Association of Home Builders. 2007. *Marketing and COmmuication Strategies for Agin and Accessibility (CAPS 1)*. Washington D.C.: National Association of Home Builders.
- . 2015. *What is Universal Design?* Accessed 31 March, 2015. <http://www.nahb.org/generic.aspx?genericContentID=89934>.
- National Fire Protection Association. 20015. *NFPA 101: Life Safety Code*. Accessed October 30, 2015. <http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=101>.
- National Institue on Aging. 2015. "Do Exercise and Physical Activity Protect the Brain?" *National Institue on Aging*. February 13. Accessed March 5, 2015. <http://www.nia.nih.gov/alzheimers/publication/preventing-alzheimers-disease/search-alzheimers-prevention-strategies#exercise>.
- . 2015. *End of Life: Helping with Comfort and Care*. January 22. Accessed March 5, 2015. <http://www.nia.nih.gov/health/publication/end-life-helping-comfort-and-care/introduction>.

- . n.d. "Scientific Images." *U.S. Department of Health and Human Services*. Accessed March 26, 2015. <http://www.nia.nih.gov/alzheimers/scientific-images>.
- National Park Service. n.d. *Kaloko-Honokohau National Historical Park*. Accessed November 22, 2015. http://www.nps.gov/nr/travel/cultural_diversity/Kaloko-Honokohau_National_Historical_Park.html.
- National Park Services. 2001. "Overview of Hawaiian Prehistory." *A Cultural History of Three Traditional Hawaiian Sites*. November 15. Accessed November 22, 2015. http://www.nps.gov/parkhistory/online_books/kona/history1a.htm.
- New Interior. n.d. *Bedroom Window Shutters*. Accessed 21 February, 2016. <http://www.newinterior.xyz/p/46/bedroom-window-shutters/>.
- Occupational Safety and Health Administration. 2013. "Worker Safety in Hospitals." *Know The Facts*. September. Accessed April 3, 2015. https://www.osha.gov/dsg/hospitals/documents/1.1_Data_highlights_508.pdf.
- Perkins, Bradford, J David Hoglund, Douglas King, and Eric Cohen. 2004. *Building Type Basics for Senior Living*. New Jersey: John Wiley & Sons Inc.
- Pinterest. n.d. *Pinterest*. Accessed February 20, 2016. <https://www.pinterest.com/pin/505388389408619940/>.
- Polzer, Karl. 2013. "Assisted Living State Regulatory Review 2013." *National Center for Assisted Living*. March. Accessed July 19, 2015. http://www.ahcancal.org/ncal/resources/Documents/2013_reg_review.pdf.
- Powell Remodeling. 2011. *Windows and Siding*. Accessed January 14, 2016. <http://www.powellremodeling.com/windows-siding/>.

- Qsx Software Group. 2016. *Color Meaning*. February 7. <http://www.color-wheel-pro.com/color-meaning.html>.
- R, Daria. n.d. *The Seven Principles of Universal Design*. Accessed March 30, 2015. <http://www.universaldesign.com/universal-design/1761-the-seven-principles-of-universal-design.html>.
- Regnier, Victor. 1993. *Assisted Living Housing for the Elderly*. New York: Van Nostrand Reinhold.
- . 2002. *Design for Assisted Living: Guidelines for Housing the Physically and Mentally Frail*. New York: John Wiley & Sons Inc.
- Robinson, Anne, Beth Spencer, and Laurie White. 1989. *Understanding Difficult Behaviors*. Ypsilanti: University of Michigan.
- SAT Industries LLC. 2016. *Fire Rated & Non Fire Rated Wood Doors*. Accessed February 9, 2016. http://satindustries.net/fire_rated_and_non_fire_ratedwood_doors.php.
- Smith, Eleanor. 2003. "Concrete Change." *The Beginnings of Concrete Change*. Accessed April 8, 2015. <http://concretechange.org/visitability/early-history/>.
- Society, The Center for an Accessible. n.d. *Universal Design*. Accessed March 31, 2015. <http://www.accessiblesociety.org/topics/universaldesign/>.
- St. Peter's Healthcare. 2016. *Photo Gallery*. February 1. https://www.nehealth.com/senior_services/Nursing_Homes/Eddy_Village_Green_at_Beverwyck/Photo_Gallery/.
- Suggs, Patricia K., and Katherine M. Logan. 1994. "Assisted Living: Improving the Quality of Housing for Older Adults." In *Housing and the Aging Population*, by W Edward Folts and Dale E Yeatts, 245-256. New York: Garland Publishing, Inc.
- Takeform. 2016. *Resources*. Accessed February 22, 2016. http://www.takeform.net/ADA_guides.php.

- Tangewood. 2016. *Walk In Bathtub For Comfort and Safety*. Accessed February 20, 2016. <http://www.tanglewoodhealth.com/index.php?page=Walk-In-Bathtub>.
- The Plaza Assisted Living. 2015. *The Plaza Assisted Living*. Accessed December 22, 2015. <https://www.facebook.com/ThePlazaAssistedLiving/photos/pb.121696281237347.-2207520000.1450825967./1020108981396068/?type=3&theater>.
- Thomas Jacobson Construction, Inc. 2012. *Seattle Green Home Project*. Accessed January 15, 2016. <http://www.thomasjacobson.com/our-work/featured-projects/seattle-green-home-project>.
- Trex Outdoor Furniture. 2015. *Yacht Club 48" Bench*. Accessed December 24, 2015. <https://www.trex furniture.com/yacht-club-forty-eight-inch-bench.html>.
- TruDoor. 2016. *Commercial Hollow Metal Doors*. Accessed February 9, 2016. <http://www.trudoor.com/commercial-hollow-metal-doors>.
2008. *Types of Care*. October 3. Accessed 1 2015, February. <http://careconversations.org/types-care>.
- U.S. Green Building Council. 2008. "Innovation in Design Credit Catalog." *U.S. Green Building Council*. March. Accessed April 2, 2015. <http://www.usgbc.org/Docs/Archive/General/Docs3569.pdf>.
- U.S. National Library of Medicine. n.d. *Medicine Ways: Traditional Healers and Healing*. Accessed October 21, 2015. <https://www.nlm.nih.gov/nativevoices/exhibition/healing-ways/medicine-ways/healing-plants.html>.
- University of Wellington. 2015. *Explorers Of The Pacific: European And American Discoveries In Polynesia*. Accessed November 22, 2015. <http://nzetc.victoria.ac.nz/tm/scholarly/BucExpl-fig-Expl010a.html>.

- Visitability. n.d. *Visitability Defined*. Accessed March 15, 2015.
<http://concretechange.org/visitability/visitability-defined/>.
- Wayfair. 2016. *Cross Handle Bathroom Faucets*. Accessed February 18, 2016.
<http://www.wayfair.com/Bathroom-Faucets-l655-c215775-O5020~Cross+Handles.html>.
- . 2016. *Vessel Bathroom Faucets*. Accessed February 18, 2016.
<http://www.wayfair.com/Bathroom-Faucets-l655-c215775-O5141~Vessel+Faucets.html>.
2013. *What are Residential Care Homes*. February.
<http://www.aplaceformom.com/care-homes>.
- Windy City Skylights. 2016. *Residential Skylight*. Accessed January 14, 2016.
<http://www.windycityskylights.com/skylights/residential/>.